

EDUCATIONAL REVIEW

JOURNAL OF THE INSTITUTE
OF EDUCATION
UNIVERSITY OF BIRMINGHAM

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NOVEMBER 1960

VOLUME 13 · NUMBER 1

UNIVERSITY OF BIRMINGHAM
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Vol. 13, No. 1

B. Inst. of Educ. & Psych. Res. Inst.
(J. & R. I.)

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J 832

November, 1960

32

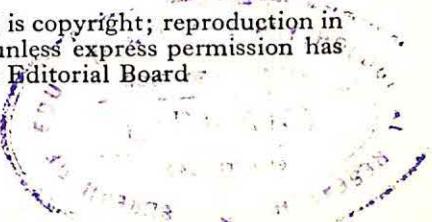
EDUCATIONAL REVIEW

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SCIENCE IN THE JUNIOR SCHOOL

A REPORT OF SOME RECENT RESEARCH

by W. Curr

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I. INTRODUCTION

THE reviewer of a text-book for junior school science in a recent issue of an educational journal remarked that the teacher's reaction to the idea of science in the junior school might well be, "What—another job to distract us from the real business of coaching for 11+!" Even from a less cynical viewpoint, it is no bad thing that science, now attempting to elbow its way into the crowded junior school curriculum, should be compelled to justify its case for a share of school time, unlike some subjects which, as "sitting tenants", tend to remain in the curriculum for no better reason than that they have always been there. "Science as a school subject is a comparative newcomer," writes W. H. Reynolds in an article in the previous issue of this journal, and if that is true of the grammar school, how can we justify its intrusion into the junior school?

The claim that science has become more necessary to-day rests on two main arguments—the need for a minimum of scientific and technological literacy to understand the everyday experience of the community we live in, and the urgency of scientific and technological competence to keep pace with our political and economic rivals. The charge of "scientific illiteracy", now often levelled at the arts specialist, is not always justified, yet it is true that few find it easy to keep pace with the growth of the highly specialised knowledge required to understand the achievements of modern technology. In a recent comparison of the knowledge of arts and science graduates in a Scottish college of Education, only four out of seventy on the arts side could answer, "What does a cyclotron do?"—but even this revealed the impact of topical publicity in comparison with the two correct replies to, "What does a dynamo do?" (1). Morris, the author of that study, concluded that "there are some remarkable gaps in the all-round knowledge of these highly-educated people".

More insistent even than the need to understand the material

environment is the claim for the production of more scientists in the interests of national security in the military and economic fields, "the attitude . . . that as a nation we must study science to survive in the modern world" (2).

All this may justify a plea for high standards in scientific education, and for expansion of available facilities, though in passing one might pause to wonder whether in the past we have done so badly. In this world so revolutionised in their respective spheres by television, penicillin, radar, the jet engine, nuclear fission, the vast expansion in applied electronics, it is not entirely irrelevant to recall the rôles of John Baird, Alexander Fleming, Watson-Watt, Whittle, Rutherford, Clerk-Maxwell. This is not to suggest complacency, but merely to recall, in these days when changes are clamorously demanded, that the system which produced these men cannot have been wholly lacking in stimulus and opportunity. Can we do better in the future? And more specifically, can we do better by starting earlier? The traditional placement of topics at particular ages in children's development seldom rests on any sound justification. Much of the secondary school's work in mathematics or in languages could certainly be begun in the junior school. Would a similar "advancement of science" be possible?—and if possible, would it be desirable?

The answer to these questions depends partly on the aims of science teaching. These fall into the three categories familiar in curriculum-justification: discipline (or formal training), utility, culture. They have often been discussed in relation to the secondary stage. Have they any relevance for the junior school?

The discipline theory has sometimes been used to justify retention in the school curriculum of occupations for which their exponents could find no other excuse. Much of the precious school time of children has been wasted in activities claimed to "train the mind"—and if we ask "what is the psychological effect of studying natural science, . . . we are apt . . . to be told that it gives the student a scientific attitude to life, or that it trains the mind to be critical and objective" (3). Yet the scientist "outside his subject . . . is no more objective or less liable to prejudice than the rest of us" (4). Furthermore, a writer on secondary science teaching remarks that the discipline theory has been the source of much bad teaching (5). "No matter should be included in a syllabus merely for the sake of the training it gives" (6). Nevertheless, "it must be the conscious aim of the teacher to inculcate . . . accurate observation, the reliance

upon experiment rather than mere authority whenever possible, and the dispassionate weighing of evidence" (7). These are still essential attitudes in seeking truth; they will be essential still in 1984. Is it not worth while to attempt to implant these attitudes at as early an age as possible? After all, if we dispense altogether with training in scientific thought and merely present a collection of interesting scientific facts and phenomena, can we claim to be teaching science at all? Many children—even at the secondary school level—"learn a whole rag-bag of scientific facts without ever grasping what science is about" (8). The cultivation of a scientific attitude lies not in the subject matter but in the method of instruction. To hope that the introduction of science into the junior school would create a scientific outlook is a fallacy—but the facts and phenomena and history of science can be used as material with which to teach the scientific approach not only in science but in other fields inside and outside school.

Justification of science on utilitarian grounds is easier, but whether utilitarian ends could be met at the junior school stage is doubtful, and there is a danger that in attempting to teach "useful" science one might in fact be teaching only technical skill. Science at the level of a junior school child's understanding can hardly hope to be very useful. It is the pleasure of knowledge about his world that he can hope to gain; this is the Greek view of science as described by Sir Richard Livingstone: science is knowledge—of *all* that concerns man. "Apart from its material benefits, it is self-justified" (9). "Science goes steadily about her work, revealing, as she does it, the greatness of man" (10). This "gloriously useless" interpretation of science is a far cry from the demand to keep up with our technical rivals, but if we accept that "life in all its manifestations" is the subject matter of education, then science has a place in education at every stage, and in this sense, it is never too soon to begin, since children's questions about the world they know soon wander into the fields of electricity, sound, astronomy, geology, dynamics.

But can this be done in the junior school? Can children of seven to eleven years *understand* scientific explanations of familiar phenomena? Is it practicable to attempt science with the junior school's limited manpower, accommodation and materials? Is it wise to begin without the benefit of specialist teaching? Is it so important to raise the level of scientific achievement that we must attempt the earlier start even if it is less justifiable on pedagogic grounds?

2. ATTITUDES TO THE PROBLEM

A number of recent investigations (11) have sought to answer some of these questions. It is a familiar phenomenon in English education that reforms tend to be advocated merely on opinion with little attempt to assemble relevant facts either by experiment or by comparative study of the practices and the degree of success of systems other than our own. But to argue the case for earlier scientific education in this unscientific way would be particularly unreasonable. A first source of evidence is a study of the opinions of those whose experience as teachers might make them especially well qualified to judge both the practicability and the probable success of such a venture. Porter (12) conducted such an opinion survey by constructing an attitude questionnaire on the Thurstone and Chave model (13). It is not difficult, of course, to obtain some indication of the general opinion on the practicability of teaching science in the junior school by simply inviting a large number of people to express their opinions freely. Such an unscripted approach, however, tends to elicit a mass of very valuable material which is nevertheless intractable because of the diversity of aspects of the problem which various respondents have considered, and the variety of modes of expression adopted. The essence of the Thurstone-Chave method is that such a collection of opinions expressed in unscripted discussion (or in writing) should be presented to a small group of "judges" who will assess the degree of support or opposition implied in each expression of opinion. Thus the whole collection of opinions may be placed on a continuum, position on which can be indicated by an arbitrary numerical scale value; e.g. in Porter's study, the statement "The young child's natural curiosity makes science a suitable subject for the junior school" was assigned (by pooling the independent assessments of the judges) a scale value of 20, while "It would be dangerous to undertake science teaching in the junior school without specialist teachers" received a scale value of 73. Low scale values indicate the favourable end of the scale, and statements with values in the region of 100 are those expressing opposition to science teaching in the junior school.

From the calibrated scale, ambiguous statements (on the meaning of which the judges disagreed) and superfluous statements were eliminated, and the remaining expressions of opinion (30 in all) were then presented to a sample of 131 persons including heads and assistants in junior and secondary schools, training college lecturers,

teachers on secondment taking advanced courses in education and psychology, and students in training for teaching.

The results of Porter's investigation showed that all the groups questioned were remarkably favourably disposed to the idea that science should be taught in the junior school; the mean scores of *all* the groups of respondents (analysed by occupation, type of school, age, sex, experience, scientific training, etc.) lay between scale values of 28 and 38, indicating a heavy preponderance of endorsements of favourable statements. This would seem to imply that the statements one sometimes hears disapproving of the introduction of science to the junior school (such as "Even simple science is much too difficult for young children to understand") are not representative of any appreciable body of opinion in such a sample as this. An interesting fact which emerged in the course of the investigation was that while all the statements could fairly be said to indicate attitude to science in the junior school, they drew on different criteria. Thus the statement just quoted is concerned chiefly with the capacity of the learner; of the two quoted earlier, one considers the response of the learner and the other the problem of teacher supply. Porter's attitude scale in fact resolved itself into four independent sub-scales on (a) the importance of science in education, (b) the probable response of children of junior school age, (c) the effect of junior school science on secondary school work and on the community's need of scientists and technologists, (d) the practicability of providing satisfactory work in science in the junior school. Responses in categories (b) and (c) were particularly favourable, though junior school heads were notably optimistic on (d)—the practicability of providing science in the junior school. Several respondents, in comments on the scale, mentioned the difficulty of knowing what was implied by "science". This is in part the difficulty discussed above, of defining the aims of science teaching. Is science to be taught "as a body of fact, or as a technique of investigation" (14)? According to the answer to that question, one may modify one's response to items in category (b) particularly. But part of the difficulty implied in the comment "What is science?" is one of selection. What *branches* of science are important? interesting? comprehensible? practicable?—in the junior school. We turn now to some studies of these aspects.

3. WHAT KIND OF SCIENCE?

Studies of "readiness" are familiar in the basic subjects, and

1 readiness tests are available to assess whether children in the infant or early junior school have reached a stage when formal instruction in reading or in number may profitably be introduced. Similar tests in the field of science are rare (15) and normally attempt to predict scientific aptitude only at the secondary level. Dickie (16) has produced a group test which he has validated over the age range 9⁶ to 11⁶ with an IQ-range of 75 to 160. Normal procedure in construction of tests of this kind is to assess the probable aptitude in the subject in question by setting problems involving similar abilities but not requiring any previous knowledge of the subject-matter, the test being then validated by correlation with subsequent success. Dickie, using tests of interest, observation, classification and reasoning, was able to show a correlation of 0.75 with success in a subsequent test-lesson on combustion. An interesting section of the test presents a series of pictures with the non-directive instruction "Write a few sentences about each of the following pictures." One, of a little boy building an obviously unstable tower of bricks, provides excellent examples of the three types of response elicited from junior school children—(i) descriptive: "There's a little boy and he has a brick and he's going to put it on top of the tower he has just built . . .", (ii) objective: "That wouldn't do! these four would fall off", (iii) imaginative: "This little boy is called Tommy. It's his birthday and he's three years old. He has built a lovely tower of bricks . . . (etc.)" (this can go on for a long time!). Such material clearly offers a possibility of differentiating the capacity for accurate, relevant and critical observation which is certainly essential in science.

4. SCIENCE READINESS

What is science?—critical observation, classification, reasoning . . .? But what should be the *material* of junior school science?—those aspects of physics, chemistry, botany to which tradition has so often limited school work? Or in the junior school must we range more widely—over light, magnetism, astronomy, sound, electricity, geology?—much of which is no more difficult and certainly no less interesting. Prompted by the work of Piaget and Inhelder, and of Deutsche (17), a number of studies have attempted to assess the capacity of children for logical reasoning, by presenting experiments to classes or individual children and then asking a series of questions of the form "Why did this happen?" and "What would happen if . . .?" For example, a teapot is filled with water

which is poured out through the spout. Then the rim is greased with Vaseline before the pot is refilled and the lid replaced. The water fails to pour. Why? Would the same thing happen if we wet the rim with water? Work done by Banks along these lines used the Guttman Scalogram technique as a method of assigning the age at which various successive levels of understanding are attained (18). More recent work by Boyes, Neal and Ross (19) ranging over the fields of hydrostatics, sound, magnetism and electricity, have used the Washburne "placement" techniques to assess, for example, the capacity to deduce from demonstration the association between pitch and frequency, or the essential difference between objects attracted and not attracted by a magnet.

Results of this work have confirmed the interest shown by junior school children in demonstrations of phenomena (e.g. in sound) which can be related to their already familiar everyday experience, and have suggested that some fields of science (e.g. magnetism, especially with boys) may offer more promising material for an early start than others. On the whole they have confirmed the pessimistic view that capacity for rational explanation does not appear spontaneously (and *can* it then be taught?) before an age corresponding to the end of the junior school, but, in common with earlier work by Washburne and others on the placement of topics in the basic subjects (20), they are unanimous in showing that understanding is more closely related to mental than to chronological age. Thus the impression often given by Piaget, that development of logical understanding is primarily a product of maturation, is not supported.

5. CONCLUSION

These studies leave many of the questions about science and the junior school unanswered. Is the junior child's "unreadiness" for science capable of reduction by appropriate preparatory teaching, in the same way as the infant school cultivates readiness for reading and for number? Do children who have actually received systematic teaching in the junior school achieve better standards than those who have not? What would be the effect of early systematic teaching on interest and curiosity in scientific matters? Further studies on these lines are proceeding now. Other and still more fundamental questions remain. Would science in the junior school be a concession to the community's vocational demands at the expense of more important subjects—such as poetry, art, music? Would an

early start in science help us "to tell students what to look for without telling them what to see" (21)? Would too early a start in science increase the risk of a materialistic outlook which would "understand all about the sun and all about the atmosphere, and . . . still miss the radiance of the sunset" (22)?

These are questions for the educational philosopher, but they are not without their implications for teaching method too.

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THE NATURE AND DEVELOPMENT OF CONCEPTS

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PART II

An investigation of concept formation among infant school children (1)

I. INTRODUCTION

IN a previous article the present state of investigation into children's concepts was outlined, and Piaget's theory, that ability to form concepts develops in fairly clearly defined stages, was briefly described. Piaget believes that all individuals pass through the same stages of development in achieving concepts and, in his writings, he assigns approximate ages to each stage, implying that development depends more on chronological age than intelligence. But he drew his conclusions without the aid of statistical data. So far as is known he did not test the same children in different kinds of concepts so it cannot be concluded from his work that any individual is at the same stage with respect to concepts in different fields, e.g. number and spatial concepts. Since there is no information concerning the number of individuals in each age group it is impossible to check the ages given for achievement of a stage and, if the spread of ages was in fact very wide for achievement of a stage, the concept of stages would be practically meaningless. Further, there is no attempt to relate the achievement of concepts to innate differences in children or to their environments, although we should expect both that greater intelligence should result in earlier achievement of concepts in all fields, and that a stimulating environment would cause all children within it to master certain concepts sooner than children less favourably placed.

2. AIMS AND PLAN OF THE RESEARCH

In this study the chief aim was to ascertain whether the various kinds of concept development as described by Piaget were self-contained or whether they corresponded, like the majority of intel-

lectual tests, to a general factor, identifiable with general intelligence, and some group factors in specialised fields. If loadings of the general factor, or total score, corresponded more closely with mental age than chronological age it would follow that, contrary to the view usually implied by Piaget, general development depended more on intelligence than age as such. Another objective was to reach conclusions, so far as the small size of the sample allowed, concerning the usefulness and validity of Piaget's concept of stages; to discover whether the nature of the children's answers showed, as some experimenters have suggested, the presence of all stages despite a limited age range, and to determine from the loadings of group factors and the children's answers, whether individual differences were sufficiently great to modify the idea of universal stages in intellectual development. Further, in an attempt to assess the effects of other influences on concept formation and to assist in identification of group factors, scores in concept tests have been correlated not only with chronological and mental ages but also with ratings of emotional adjustment and socio-economic status, and with sex, vocabulary and memory for digits. In addition, the ages of the children chosen for this study, six and seven years, were such that their answers, if consistent with Piaget's findings, should provide examples of egocentric thinking (such as animism, artificialism and transduction) and items in which this was true were distinguished from those in which it was not.

The age group selected had other advantages for the purposes of this study. The children were readily available since they were at school and they had attended school for a sufficient period to be used to their environment and to have similar experiences in learning. The sole disadvantage, but a considerable one, was that the children were too young to read and write answers to questions, so that the entire work had to be done during interviews when the experimenter observed the children's reactions and recorded their replies. This, including tests of mental age, occupied an average of five hours with each child so that work with 60 children occupied a considerable period of time. It was this which caused the size of the sample to be very small for satisfactory statistical work.

In the first place many items selected from researches, or newly devised, were tried out with a group of 12 children aged about seven years. Of these items 98 were chosen from a wide field of concept tests but with a predominately mathematical/scientific slant. They were grouped under seven headings, five being taken from

titles of Piaget's books. It was aimed to get about a dozen items under each concept so that, if they hung together consistently, a moderately reliable total score for that concept would become available.

The seven categories of concepts were as follows:

Number

Here 12 of the final items were taken from Piaget's work (2). They included tests to investigate the child's understanding of conservation of number, correspondence of sets, seriation, ordination and cardinality and additive composition of numbers. The remaining items comprised a simplified version of Piaget's hurdles and mats problem and recognition of numbers in dot patterns since it was judged important to know how securely the child had established the ability to count.

Time

In this category items were chosen from several studies. Following Sturt (3) some were selected to test conceptions of meaning of ordinary time words, e.g. a minute. Others tested ability to conceive a universal time extending into the past and future, and the ability to use dates which symbolised this scheme. The placing of epochs in correct order was thought to be too advanced for this age group but they were asked to put in order events of the day and the seasons. Remaining items tested ability to estimate intervals of time and realisation that time must be stated in making an appointment.

It will be seen that Piaget's investigations (4) were not followed closely in this field but the child's conception of age was tested in two items. Children were asked to state which of two children was older, given dates of birth, which required ability to relate later dates with younger ages; a further item tested indirectly whether children thought of adults as being all of the same age.

Quantity

Again under this heading the work of Piaget and Inhelder (5) was fairly closely followed. A variety of tasks were set to test understanding of conservation of mass, weight and volume and, in particular, the application of this understanding in making comparisons, e.g. determining which of two glasses of different appearance had the greater capacity. Items requiring understanding of conservation

of area were also included as it was felt that it might be easier to conceive of conservation in two dimensions than in three. Finally, following some American investigations into children's concepts, the concept of "middle-sized" was tested and children were asked to grade areas and volumes.

Spatial Conceptions

To achieve a largely verbal test of spatial relationships children's knowledge of prepositions was used and, bearing in mind Piaget's discovery (6) that children found it difficult to conceive of an object as simultaneously "right" and "left", we asked the children to place objects simultaneously "above" and "below", or "below" two objects at once. The children were also asked to put a farthing "inside" two or three outlines or two boxes at once. A similar relationship was investigated in questions which required understanding of the inclusion of a district within a town or country. Understanding of "right" and "left" was tested in two items. Other items involved imagination of objects from a different point of view, the child selecting or drawing the view which would be seen.

Sorting and Classifying Shapes

This section may appear out of place since it is not a category used by Piaget and most of the items were, in fact, suggested by American work (7); but, in discussing the stage of Concrete Operations, Piaget has said that children master the operations of forming classes, relations and numbers between the ages of seven and twelve years. In this section the ability to classify was tested though with a limited range of materials.

Children were asked to sort line patterns, including parallel lines, to match outlines to sets with straight or curved edges and to verbalise the difference; to sort a variety of common objects into six groups by shape, and to assign objects to groups already made. Ability to notice similarities between groups of shapes was tested, and fluency in changing from one grouping to another.

Concepts of the World

Items which remained in this section after preliminary testing originated for the most part from the work of Piaget (8), Oakes (9) and Deutsche (10). These tested conceptions of life, consciousness,

thought and dreams and the origins of names, various natural phenomena and some manufactured products, the cause of night and the origin of trees.

Physical Causality

After unsuccessful attempts had been made with Piaget's material (11) to find suitable experiments with this age group the items which remained in the section tested: notions of balance (lever, centre of gravity of plane shapes, water in a U-tube), existence and action of the air (the action of a dropper, the cause of noise from a bursting bag, combustion of a candle), understanding of motion (height risen up-hill by a pencil after rolling to the bottom of a curved rail, velocity of wheels of unequal size), rise in level of water due to immersion of objects, means of reaching an inaccessible object, the effect on the shadow of moving the source of light, and specific gravity in the case of oil and water in a bottle.

Selection of the Subjects

Children were selected from three primary schools in the London area. These included one slum school, one in a moderately prosperous working-class area and the third in an area where the children had more mixed backgrounds. In each school the headmistress was asked to select ten seven-year-olds and ten six-year-olds. In each set there were to be five boys and five girls and it was requested that in each ten there should not be more than two unusually bright or very backward children. Very probably the teacher's judgment was somewhat unreliable and the groups contained an excess of above average children. However, the distribution of Terman-Merril IQs shows that they covered a wide range of ability.

In each school a room was provided where interviews could take place. Children were, at first, collected individually for interview until they knew the way and could send each other. They were kept, when possible, until they had completed the items in one section but were allowed to go if they showed signs of fatigue or lack of concentration. They were told that the experimenter was trying to find out the way in which children think so their answers would be written down, and that, if they did not know an answer, they should say so.

The Intelligence Test and Rating Scales

Each child's mental age was estimated by using starred items of

the Terman-Merril tests. The tests were administered by the investigator after the concept tests were completed.

The score in vocabulary was specially noted and success or failure in memory for six digits was recorded separately.

Emotional adjustment was rated on a scale based on Fleming's P.A. Reading Test. Children were rated under the five headings: persistence, initiative, objectivity, concentration and stability, in each case by the underlining of appropriate remarks on a five-point scale. Scores were assigned from 0 to 4 for each trait so that the maximum score possible for all-round adjustment was 20.

It was not possible to use any recognised method of grading the socio-economic status of the children as insufficient was known about their homes. In each school the headmistress and teachers combined to give a rating from 0 to 4 based on such considerations as poverty, parental care, size of family, mother deserted or a widow, father's occupation, neighbourhood of the home, dress, toys and books, evidence of wider than average interests in the home, etc.

3. EXAMPLES OF SOME OF THE CHILDREN'S ANSWERS

1. *The conception of part and whole, or the inclusion of one area within another*

This conception was tested mainly in the spatial section. In two items it was first established that children knew the meaning of "inside" and "outside" a circle. They were then shown a drawing of two interlocking circles and were asked to put a farthing inside one and outside the other. This proved not too difficult; 48 children succeeded. But the most intelligent boy said, "Outside the right circle is out here"—indicating the area occupied by neither circle. When, however, the children were asked to place the farthing inside both circles at once only 27 could do it, and some after considerable thought. Others protested, "Not with only one farthing", or stated outright that it was impossible.

Still greater difficulty was experienced if one circle was entirely within the other. Then it became clear that many children regarded the area inside the smaller circle as bearing no relationship to the larger one. Some children said, "If it is here it isn't in the large circle."

Since it was felt that the same problem might prove easier in three dimensions because children have experience with nests of barrels from a very early age, the children were then asked to put a

farthing inside two boxes at once. Only nine saw what to do immediately. Seven children tossed the coin from one box to the other, perhaps in the hope that it would appear to be in both. 30 children announced that it could not be done; the brightest boy said, "Not even a king could do that." Three children suddenly realised what to do, while six others demonstrated the difficulty which most experienced by their solution of opening both boxes and placing one within the other as far as possible while balancing the farthing on the overlapping edges inside. It was clear that if the smaller box were shut the farthing could not be thought of as inside the larger one.

A similar conception was tested by asking whether it was possible to be in their borough and in London at the same time. About half the children realised that this was possible, some quoting their addresses to prove it.

2. *Conservation and comparison of areas*

Conceptions of conservation of area were tested by use of form-boards. The first of these contained rectangular and rhombic holes which could be exactly fitted by the same two triangular pieces. Children were asked which hole they thought was bigger and then saw the pieces fitted in. Although nearly every child had supposed the rhombus was larger 36 now stated that the holes were equal. However, 23 still persisted in their perceptual judgment, while the remaining child said, "The same when the pieces are in, but that hole is larger when the pieces are out."

A second form-board in which three pieces exactly filled two holes produced an almost identical result except that one boy now realised the significance of the pieces in both cases.

Comparisons of area were made in three ways:

(i) Firstly with a form-board with movable pieces which exactly fitted a rhombic hole, left a small gap in a rectangular hole and a considerable gap in a triangular hole. 27 children were able to explain this.

(ii) More interesting was the children's comparison of eleven rectangular shapes, ranging from a three-inch square by quarter inch changes in dimension to a rectangle $5\frac{1}{2}$ inches by $\frac{1}{2}$ inch. They were asked to say which had most paper in it and how they knew.

Methods varied considerably. Some children immediately formed a hypothesis, e.g. the longest must always be larger, and proceeded to consider this by intuitive judgment of areas. On

two of the children judged by a single dimension. These, the two dullest girls, judged by the longest edge as the shapes faced them, giving the opposite judgment if the same shapes were turned round.

Successful children described a variety of methods. Some said, "I saw how I would push them in to alter them." Others, "If you cut off this bit [fitting them] it would fit over this bit." The majority judged by overall size expressed as "always the fattest" (18). One boy said he had imagined little squares in each. (27 in all succeeded.)

(iii) Comparison of three rectangular shapes with triangular pieces removed or added.

In this item children were asked to put three shapes in order of size. 34 children succeeded. When two more shapes were added to be fitted into the sequence few children could make the necessary comparisons successfully.

3. Other interesting items

(i) *Volume. Comparison of capacities of unequal glasses.* In this item children were shown two empty glasses, one tall and thin, the other short and broad. They were asked, "Can you show me which glass holds more. You may use the water and the other glasses if you want to."

Only 11 children judged by appearance, but others failed to solve the problem. 28 realised the need for a method but either failed to think out one which would be adequate or poured water into the glasses indiscriminately. Three suggested weighing full glasses. Five used good methods but did not appear satisfied and could not explain why the method worked. Only 12 found solutions which they could easily explain. Not all of these children were highly intelligent.

(ii) *Physical causality. The Balance.* Three tasks were set in this item. Using a "Meccano"-strip lever, children were asked where to place an equal weight when one was already six holes from the fulcrum; secondly they were asked to put on two single weights to balance one double one, eight holes from the fulcrum; thirdly they were asked to balance the double weight at four holes from the fulcrum with only one single weight.

It was evident that experience with balances in school or elsewhere helped considerably, as children quoted previous experiences. Two-thirds of the children succeeded in the first two items but a few children had no idea how to begin, putting both weights one side or one weight at the fulcrum.

In the third item 20 of the children were already aware that the lighter weight must be about twice as far out. They gave such explanations as, "Out here because it makes more weight", "About twice as far", or more tentatively, "It might balance near the end."

4. ANALYSIS OF THE RESULTS

Each item was scored 1 or 0 with a view to calculating tetrachoric correlation coefficients between them. Some items, however, scored too few or too many successes to provide reasonably reliable tetrachorics and it was decided to exclude all those with less than one-fifth or more than four-fifths of satisfactory answers. This left 88 items of which only five scored either fewer than one-quarter or more than three-quarters of successes. Total scores ranged from 74 to 8, i.e. 84.1% to 9.1%, the median being 44 or 50.0%, thus the items represented a satisfactory level of difficulty for this age group.

The small size of the sample made the coefficients obtained not very reliable. Standard errors ranged from 0.20 to 0.24 according as the split was a median one or at the 20th percentile. In consequence two-thirds of the coefficients are likely to be correct within 0.20, but one-twentieth of the coefficients may be in error by 0.40 or more. Such errors do not make it impossible to show the existence of a general factor; in the matrix of correlation coefficients there are nearly eight thousand entries so it is to be expected that the errors will, to a large extent, cancel out in the calculation of the first factor loadings. Residual coefficients, after the extraction of the first factor, are too unreliable to be subjected to further analysis, but it proved possible to group the positive residual coefficients, indicating the presence of six subsidiary factors, and to apply Burt's Group Factor method to obtain approximate loadings.

In addition a tetrachoric coefficient was obtained for every item with sex, vocabulary score, chronological age, and ratings for emotional adjustment and socio-economic status, while biserial coefficients were obtained with mental age. These coefficients were studied to see if they cast further light on factors influencing ability to conceptualise or on the nature of the subsidiary factors.

The general factor

The loadings of the first factor obtained by applying Burt's Group Factor method are, with only two exceptions, positive. Contrasting the small number of items obtaining very high loadings with the further small number obtaining very low, or negative,

loadings it is evident that those with high loadings demand greater capacity for reasoning than those with loadings approaching zero. Also, the biserial coefficients with mental age were included in the matrix and it was found that the first factor loading for mental age, as measured by Terman-Merril tests, was 0.90. This high loading suggests that the first factor may be identifiable with verbal *g*. Items with low saturations in the general factor may, of course, have been subject to considerable errors and unreliability but there is a tendency for these items to represent practical experience or judgment which is relatively independent of ability to verbalise. It appears that the separate verbal factor found by Thurstone (12) with young children is merged into the general factor owing to the large language element in the items. This conclusion concerning the general factor (that it is identifiable with verbal *g*) is supported by comparison of all first factor loadings with the biserial coefficients of each item with MA as it is seen that they follow an almost identical pattern.

Study of correlations between items and ratings of various kinds shows the importance in the general factor of mental age, vocabulary and emotional adjustment, in that order. Their mean correlations with all items are 0.38, 0.37 and 0.26. Thus emotional adjustment was not found to be of such great importance as Lovell (13) found in his study of conceptualising in adolescents, though it is by no means insignificant. Other mean correlations with all items show, in decreasing order: memory for digits 0.24, socio-economic status 0.20, chronological age 0.16, and sex 0.08. The small importance of chronological age as compared with mental age must be partly due to the small range in age of the sample (21 months), less than a third of the range in mental age (6 years 4 months), but we can conclude that development in concept formation depends more on increase in mental age than chronological age, contrary to what Piaget usually implies in his discussion of stages.

This seems worth stressing, despite Piaget's assertion on one occasion that he was not concerned with the ages but only with the order of the stages, because he still tells us that "this stage is reached at about seven years" and it is worth while to bear in mind that if achievement of the stage depends on mental age and the mean age of this achievement is 7 years, then two-thirds of children aged seven can be expected to reach the stage between the ages of 5 years 10 months and 8 years 2 months; nineteen-twentieths between the ages of 4 years 8 months and 9 years 4 months; while the remainder

will either reach the stage still earlier than 4 years 8 months or not even by 9 years 4 months. In short, to say, "At about seven", will be misleading to the majority of readers.

The subsidiary or group factors

Identification of the group factors is not easy as there is some overlap between four of them. Thus only two factors which are denoted by capital W and capital P are relatively independent.

The factor W is composed chiefly of items from the section on Concepts of the World. Study of items with the higher loadings (0.25 or more) show that they are mostly pieces of information such as a child might obtain from questioning adults or from books and lessons in school. But four items with high loadings come from other sections and the feature common to these is the ability to see the point of view of another person; a fifth item requires a logical approach as distinct from a perceptual one for success. This suggests that the factor connects closely with Piaget's "emergence from egocentric notions" and is concerned with naturalistic explanations. Piaget has maintained that there is a gradual emergence from egocentricity to a rational/logical attitude to the world and that this enables the child to free himself from the "centredness" of perception so that he sees other people's points of view and seeks rational explanations of natural phenomena. The relative importance of chronological age and sex in this factor is consistent with such an interpretation for, in general, older children have more information and should be more free from egocentric/animistic beliefs, and Deutsche and other investigators have found that boys give rather more rational/logical explanations of natural phenomena.

The majority of the items in *factor P* are found under the heading "Spatial Concepts". Items collecting the highest loadings all involve ability to grasp two relationships at once, e.g. that a farthing can be inside each of two boxes at once. The inclusion of some items from the section on "Time" is at first sight surprising; but time can be conceived, and is often represented, spatially. Piaget believed space and time to be an indissociable whole and emphasised the importance of establishing a spatial order in understanding age. This factor is related to the spatial factor of Thurstone (12) which she describes as "involved in any task in which the subject manipulated an object imaginarily in two or three dimensions". It is of interest that there is no overlap of spatial factors with time in adults, but it has never been sought. The large verbal overlap of this factor may be ex-

plained by the importance of spatial vocabulary in the spatial tests.

Of the remaining group factors the one fairly easily identified was concerned with conceptions of *quantity*. This appears to be the factor closest to Thurstone's quantitative factor found in experimental work with a similar age group. As we should expect there is a sex difference in favour of boys (the mean residual correlation coefficient being 0.13). Further support for the identification of this factor was provided by the high mean residual correlation with memory for digits (0.12).

Of the three less clearly defined factors the first appears to have a scientific, quantitative, mechanical tinge, the second is a mainly perceptual factor, while the third may be determined by sex difference for there does not seem to be any consistent psychological content; it is composed of items in which girls markedly excelled.

5. CONCLUSIONS

Stages in development of concepts

It has already been remarked in discussion of the nature of the general factor that development in ability to form concepts depends more on mental age than chronological age. We now see that it is dependent in different fields on special abilities; these do not correspond with the original categories though they do show some grouping. It follows that the categories used by Piaget are not distinct, independent categories and that, since special ability in a particular field enables a child to excel others of his own mental age, the idea of overall stages in children's ability to conceptualise must be modified. This does not disprove Piaget's assertion that the development of any individual takes place in the order he has outlined in describing stages of intellectual development, but it does suggest that he has underestimated the degree of variability in any one individual's development. For example, we saw that Stephen, a child of outstanding ability in most fields, was relatively retarded in spatial conceptions. It also suggests that Piaget has not appreciated the very considerable differences between one individual and another. The presence of group factors in ability to form concepts lends some support to those investigators who have found answers of all stages at all ages, or to those who find that individuals favour different ways of conceiving the world; the rational/logical or egocentric/animistic nature of an answer may be determined more by the kind of individual than by age or intelligence.

Comparisons with Piaget's results

It is of interest to consider to what extent the answers of these 60 children differed from those described by Piaget. Comparison is not always possible as the ages given by Piaget corresponding to particular stages are frequently only rough indications.

For convenience, retaining the original categories, we find that in their conceptions of number the children achieved similar results to those noted by Piaget and his collaborators. The sole exceptions were that they found more varied ways of comparing $7+1$ with $4+4$ and thought of counting the totals, in some cases, at six years; while in comparing beads in a dish with an equal number in a tube the children arrived at an understanding of conservation of number earlier than Piaget's subjects.

With regard to conceptions of time, comparison is less easy with Piaget's work since the nature of the questions was different. All but 16 of these children did appear to believe that adults were all the same age, and only seven could say which child was older given their years of birth; but one of these children was considered backward (Peter, age 5.11, MA 5.4).

A considerable divergence from Piaget's findings was found in the children's conceptions of quantity. He found conservation of mass, weight and volume to be understood in the age ranges 7-11, 8-12 and 10-12 respectively. In our study some six-year-olds showed a good understanding of conservation of mass in their ability to apply it to the comparison of capacities of glasses of different shapes. Others were already convinced of the conservation of weights: one six-year-old girl said of the ball of plasticine, "The same, it's only rolled into a sausage." In testing understanding of conservation of volume some of the youngest or least able children did not attribute the rise in level of liquid to forces or weight but explained that objects took up space so causing the water to rise. We have already seen that some children had a sound understanding of conservation of area.

In spatial conceptions the children again were in advance of the Swiss children in some items. Piaget states that the possibility of being simultaneously in Geneva and Switzerland was realised by only a quarter of all children before nine years. We found similar relationships understood by half our subjects. Piaget found grasp of the relationship right/left from another person's point of view to appear between eight and eleven years. Nearly half our subjects had

understood this also. In understanding of perspective the results corresponded more closely with Piaget's but, whereas he believed the concept of bird's-eye view to develop only after nine years, several of our subjects had partially or perfectly understood this at six or seven years; they included one girl with an IQ of 85 who proved to be living in a top tenement flat. Possibly this suggests the importance of experience in attaining concepts by a particular age.

Considerable divergence from Piaget's findings appeared in some items under Concepts of the World. Piaget placed understanding of thinking, the origin of names, and dreams, at about 11 (or 10) years, and assigned fully satisfactory answers to his fourth stage. In this study fully satisfactory conceptions of thinking were found in 44 cases and of the nature of dreams in 29 cases. Conceptions of the origin of names corresponded more closely with Piaget's findings; many of the answers were of a similar type to those he describes but more than half the children realised that they did not know and five gave answers characteristic of his fourth stage. These were children in the older group but were not more than average in intelligence; they were distinguished rather by a matter-of-fact turn of mind.

In answering questions about physical causality these children, like those described by Deutsche (10) and Oakes (9) in America, rarely gave non-physical answers. Throughout the experimental work children showed a questioning attitude, desire to experiment and to find out for themselves, and realisation of their ignorance in the face of new phenomena. Though many errors occurred through belief in the infallibility of perceptions no child displayed a consistently uncritical attitude.

The divergences from Piaget's findings are not so considerable that his idea of mental development taking place in stages must be discarded; but there is evidence that it must be modified not only on account of wide intellectual variation between individuals but because experience and the influence of the prevailing culture modify children's responses. The largest divergences from Piaget's findings occur in children's conceptions of the world and in their understanding of quantities and, to a lesser degree, in explanation of physical causality and spatial conceptions. These are fields most affected by the general advance in scientific and technological knowledge which increase both information and the tendency to question beliefs and theories. In addition, opportunity to experiment in schools and provision of materials to manipulate and measure may well contribute to spatial knowledge and to a critical attitude.

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THE SECONDARY TECHNICAL SCHOOL

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THE secondary technical school is now accepted as a selective secondary school receiving its pupils at 11+, offering a full five- or seven-year course, and enjoying the same conditions of entry and quality of pupil as the grammar and other selective schools. In other words, admission is on the results of a common entrance examination, with parental option, and the pupils are a fair cross section of the higher ability portion of the age group.

The schools, as we know them, are a new type, lively, and with standards of teaching, premises and equipment fully comparable with the best ideas in modern school building and organisation. The education offered in the schools is broad in its general values and covers what may be called a liberal education with some bias in its technical character towards industry, or a group of industries. In the case of boys' schools (and this article is principally devoted to such schools), the bias is towards the technology of the constructive and extractive industries, particularly engineering, building, applied chemistry, metallurgy and the allied trades and professions. The bias can be wide and varied in its coverage and prepares pupils for entry to the industry at all points, with particular emphasis on the higher technological training levels, and with a wide range of entrance qualifications, usually measured on G.C.E. standards at "O", "A" and "S" level.

The influence of industrial requirement does not become a threat to the quality of the general education, for it is, properly, a stimulant to the sense of purpose and provides the link between the academic portion of the instruction and its applications. The first two years of the course follow the common pattern of English language and literature, history, geography, music, art, mathematics, general science and religious instruction, and also includes a foreign language and physical training and games. The teaching of bias subjects at this stage is very small: a little craft work, usually wood-work, and some geometrical drawing which is the practical work of the mathematics course and is also the introduction to technical

drawing given in the atmosphere of the drawing office, with drawing-office instruments and methods.

The third and fourth years develop the general study towards the requirements of General Certificate; the craft training widens to include some metalwork and artistic crafts; the science takes on a subject differentiation, namely to physics, chemistry or biology; and the drawing leaves the mathematical field to embark on that of the technological. Technical drawing becomes a language and a method of expression which later on is to become the second language of the technologist.

Some "setting" has taken place in the fourth year and the pupil enters the fifth year with the diagnosis, as far as G.C.E. subject entry is concerned, complete. He then follows a course of study in preparation for a range of certificate subjects, selected according to his abilities and aptitudes and having some bearing on his future. Generally speaking, by this time, most of the pupils will have sufficiently decided upon their future to know what subjects are essential to them for the professional needs they have to face, and about these requirements the G.C.E. programme is built.

The completion of the fifth-form year is the end of school life for a proportion of the pupils, most of whom enter industry as apprentices, as juniors in the professions, or other training schemes within their qualifications. The remainder form the sixth forms and embark on varying interests: engineering and its allied professions, particularly those of chartered standing, or a university career. Almost invariably the major call for sixth-form study to advanced level is pure and applied mathematics, physics and chemistry, and naturally the bulk of the instruction follows some such course. Non-examination subjects such as history, current affairs, craft work, art, combined with personal hobbies and interests, appear in the sixth, and school societies and other activities flourish. The school library is available at all times in the school life but is particularly attractive to the sixth, both as a source of reading and inspiration.

Industry itself is interested in the pupils at all stages, particularly at sixth-form level, from which the entrants for "sandwich schemes" and other industry-based courses of university quality have to be provided. Able boys will proceed to the university, some on scholarships or grants, others through the established schemes in industry, such as the sandwich schemes where freedom from the "means test" is an attraction to the parent of moderate means.

This briefly describes a school which has its own corporate life, is always a strong contributor to competitive sports and athletics, and whose members are to be found in all social and educational activities in equal proportions with the pupils of the more traditional schools.

The technical school is new in its present form but in it survives half a century of tradition expressed by what may be regarded as its prototype, the junior technical school. The junior technical schools were generally housed in technical colleges. They shared, as common users, the finely equipped workshops and laboratories of these colleges and produced pupils whose services were highly prized by industry and who later became the senior students of the colleges. A tradition developed in these schools in which an intense sense of purpose controlled the studies. There were high standards of craftsmanship and execution, and a familiarity with the apparatus of industry both on the "shop floor" and the industrial laboratory. The pupils achieved remarkable success in the National and Higher National Certificates and many became members of the chartered institutions. So marked was this achievement that the White Paper on Technical Education contained reference to this success and particularly to the performance of these schools as a whole.

Thus the pattern was set for a close understanding between the colleges, industry and the school and this pattern has continued, bringing the best of that which was in these old junior technical schools into the structure of the new secondary technical school.

The older established schools have set standards for the new and with the greater infiltration of technical courses and subjects into other secondary schools the secondary technical school has given guidance on equipment and teaching methods and has staffed teacher courses in technical and applied science both locally and nationally. Quoting from Lord Hailsham, speaking as Minister of Education in 1957:

Even in independent schools with a strong academic tradition 40 per cent of the specialists take scientific or mathematical courses. In maintained grammar schools the trend is even more marked, and the percentages are reversed. But is there not a case for a type of selective secondary school, setting its sights as high as the grammar schools, but which starts from fresh foundations uninfluenced by the ancient tradition? Provided such a school does not attempt to set a general pattern, and aims only at a variant of the general pattern, in my view there is. The influence of such schools might be out of all proportion to their numbers. In the first place they could not fail to set the pace for the technical studies and courses in the grammar

schools themselves. In the second place we know how imitative, sometimes to their disadvantage, secondary modern schools can be, of the grammar school tradition. The presence of a modern technical tradition of equal quality in an area could not fail to influence the general climate of educational opinion.

It may now be desirable to examine the organisation of the old junior technical schools because by so doing the need for the revision towards the new technical schools becomes apparent and emphasises the need for strengthening the school life, improving the quality of entrant, increasing the length of course and the breadth of teaching.

The origin of secondary technical education was in the trade schools of pre-1914 years, which were schools solely pre-apprentice in character with far too strong a bias towards craft and craft subjects. The trade school is entirely foreign to our conception of education and very early in the 1920's these schools gave way to the junior technical schools, in which the technology became only a moderate bias and a fairly good general education was an accepted condition within the schools.

The people who taught in the junior technical schools and have since pioneered their successors, the secondary technical schools, were always conscious of the limitations forced on the schools by what has since been proved a narrow outlook in their administration. Principally, the criticisms of national and local education outlook on these schools may be summarised as follows:

- (1) They were recruited for on a second creaming at 13+, the assumption being that the first creaming at 11+ must go to grammar schools and receive a five- or seven-year school life.
- (2) The second and sometimes third, or even in a few cases up to sixth, creaming for pupils was limited to a two-year, and in some cases a three-year course, commencing at 13+. In spite of this limitation, appreciation of these pupils by industry increased, and the leavers were popular with industry for really progressive posts. In fact they were often preferred at the age of 15-16 to their first creamed colleagues.
- (3) Authorities, without consideration for school organisation or efficiency, recruited these pupils terminally, sometimes in double or treble terminal streams. The only reason for this policy was that industry preferred to accept school leavers terminally rather than yearly. There still survive schools with this terminal entry, destructive to corporate life, with difficult school organisation and in every way, except this

very doubtful satisfaction which industry enjoys from being able to tap the leavers terminally, a problem in a selective school.

- (4) In some cases streams were labelled "Engineering" or "Building" at entry and the bias was co-ordinated with this label. This practice has been to a very large extent dropped, but it did, during its life time, produce very unsatisfactory conditions in the school life.
- (5) Only in those schools with three-year courses could any serious attack be made upon the G.C.E. examinations with any wide coverage. Many of these schools embarked upon an objective of up to eight "O" level subjects with results which staggered those in the schools themselves as much as their critics. Occasionally very able pupils entered the universities, but always working against the effect of second creaming and curtailed school life.

There were certain advantages in the junior technical school and these could be summed up as a realistic sense of purpose in the pupils themselves, an always sympathetic and receptive industry, with an associated link with further education in its technical colleges, and possibly, above all else, a basis of staffing which admitted to the teaching staffs teachers with industrial and commercial experience who were able to draw widely on this experience in their methods of teaching and selection of examples.

Clearly the disadvantages loaded on to this type of school far outweighed the advantages, and the 1944 Education Act sowed the seed from which has sprung the present secondary technical school. It has developed in its own premises no longer shared with "Further Education", with a broad curriculum related at all stages to a liberal education. Selection is on a first creaming at 11+ and entry is made to all G.C.E. examinations at "O" "A" and "S" levels. The school has liberal sixth-form accommodation and is staffed to meet the requirements of high scholarship not only in the subjects of the bias but also in the general education leading to university and professional entry.

The future of the separate secondary technical school has, in common with that of the grammar school, been challenged in some parts of the country; but against this there is a story of continuous success and further development of these schools, particularly in areas of concentrated industry.

It seems fair to say that in selective secondary education different types of schools will have special appeals to different types of pupils. Those who teach in secondary technical schools feel that these schools offer a presentation and atmosphere particularly acceptable to the pupil who hopes, eventually, to make administration, supervision or design in industry, his life work, or aims to become a technologist, qualified in the accepted way to the standard of a university degree or diploma of technology.

THE RELATIONSHIP BETWEEN PRE-COLLEGE EXPERIENCE AND TEACHING ABILITY

by THE TRAINING COLLEGE RESEARCH GROUP
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I. INTRODUCTION

ALL training colleges consider selection to be a strenuous but essential part of their present-day procedures and in all cases a careful and extended survey of the abilities, aptitudes and personalities of those who have applied for admission is regularly undertaken. On the academic side a study is made of the applicant's examination records and, in some cases, special tests are set during the selection period. Tests of intelligence, personality schedules and the like, while not regularly employed, are sometimes used experimentally. The report of the applicant's Head is given due weight. In almost every case, too, the applicant is subjected to one or more interviews the purpose of which is to deal with the more intangible elements of the personality, to integrate the evidence from different sources, and to look specifically for those elements which are thought to be important in or a bar to teaching. Since what a person is to become can only be assessed at the selection stage on what he now is and since this, in turn, is largely based on his previous record, it is important to consider how valid such information is. Validity in this sense can only be determined by noting carefully at selection the qualities in each applicant which were thought to be important and evaluating these against some subsequent performance.

Some studies along these lines, though not a great number, have already been published. The Training College Research Group (1) of the University of Birmingham's Institute of Education has, during the last two years, been making a particular study of non-academic elements which, if considered at selection, might help to improve the procedure. In this report it is concerned with those elements which it has called "pre-college experience", a term which it has used widely to cover previous teaching experience, experience in other jobs before coming to college, and experience in various

activities of a social and athletic nature, both in and out of school. It has also included in the term the experiences which are the consequence of different family sizes, different age and different family occupational status.

Experiences of this nature have always been thought to have some significance and questions about them have not infrequently been asked at the interview stage. There has, however, been singularly little evidence of the prognostic validity of such pre-college experience. With the introduction of the three-year course of training and the continued concern of all to get into the training colleges students of a calibre adequate to meet the demands which an expanding educational system is going to impose, it was thought that this might be an appropriate moment to undertake and to report such a study. It has to be emphasised at the outset that the research process simplifies and sets limits which are more restrictive than those found in any real situation. It has to be emphasised too that such research also needs an evaluative criterion. Such a criterion is not always easy to find and may itself, when found, be somewhat restricted. Nevertheless we think the results are interesting enough, even though secured under the restricted conditions indicated above, to warrant this brief report. In the main we have limited ourselves to reporting and to making brief comments in the expectation that the reader will prefer to make his own interpretation.

2. PROCEDURE

A questionnaire was devised which covered five main fields:

- i. Biographical data.
- ii. Interests and activities both in and out of school.
- iii. Teaching experience before coming to college.
- iv. Experience, other than teaching, before coming to college.
- v. Family data.

The items of the questionnaire can be inferred from the details of this report. Following preliminary trials, the questionnaire was submitted to all second-year students in six colleges. A total of 613 completed questionnaires was obtained, 129 from men and 484 from women. This sample of students went on to complete their training college course in the summer of 1959 and at that time their final examination results became available. Of these the final teaching marks alone have been used as a means of evaluating the items of

the questionnaire and therefore of the experience to which these items relate.

It must be emphasised that this evaluation is in relation to the final teaching mark only. The limitations of the latter as the sole criterion of success in a teacher training course are well known. It is, however, a useful validating measure if its limitations are remembered and understood.

3. ANALYSIS OF RESULTS

Most, though not all, of the questionnaire items are in a form in which they can be answered Yes or No. The most straightforward way of evaluating each item would then be to compare the average teaching mark of those students who answered Yes with that of those who answered No. The main concern in such an experiment as this is, however, to get unequivocal results for the extreme students, namely those who do well and those who do poorly. The performance of the average group is of less interest. But such a group is, of course, the largest in the college. Further, experience shows that this large group will usually be fairly evenly divided in their responses Yes and No. Consequently, the rather fine differences which are being sought for the extreme cases tend to be masked by the responses of the large average group. The procedure adopted, therefore, has been to divide the whole group of students into three categories based on their final teaching marks. The division was arranged to give reasonably sized and roughly equal extreme groups and to leave the average bulk of the students undifferentiated in the middle. The divisions and the numbers involved were as follows:

Teaching mark	A, A -, B +	B, B -, C +, C	C - and below
No. of students	53	487	73

Each of these groups was, for the Yes-No items, then split according to the responses made, giving tables of which the following is an example:

MEMBERSHIP OF A SCOUT TROOP OR YOUTH CLUB

Teaching Grade	A to B +	B to C	C - to E	Totals
Response	Yes	18	186	233
	No	35	301	380
Totals	53	487	73	613

An example of a similar table where the response categories exceed two is as follows:

FAMILY POSITION				
Teaching Grade	A to B +	B to C	C - to E	Totals
Family Position	Eldest	16	168	29
	Youngest	16	116	14
	Middle	10	91	11
	Only	11	112	19
Totals		53	487	73
				613

The frequencies thus entered were then compared with those which would be expected to appear, on the assumption that there was no relationship between the teaching mark and the response to the item. This is, of course, the familiar chi-squared test and where the difference between the frequencies expected and the frequencies obtained is a significant one the presence of a relationship between the teaching mark and the item response may be inferred. Thus in the case of all items for which the level of significance equals or exceeds the usual 5% level it has been thought worth while to include tables like those above. Additionally are shown the expected frequencies in brackets, the values of chi-squared obtained and the level of significance to which these correspond.

4. DISCUSSION

As already stated, when the hypothesis that there is no relationship between the teaching mark and the response to the item is disproved by the obtained value of chi-squared the result is said to be significant. An example of a table yielding a significant result is as follows:

DID YOU BELONG TO A DRAMA OR MUSIC GROUP?					
Teaching Grade	A to B +	B to C	C - to E	Totals	
Response	Yes	17 (12.88)	123 (118.37)	9 (17.74)	149
	No	36 (40.12)	364 (368.63)	64 (55.26)	464
Totals		53	487	73	613

The figures shown in brackets represent the frequencies which would be expected on the assumption of no relationship. Inspection of the obtained (upper) frequencies and the expected (lower) frequencies reveals that the good (A to B +) teacher said Yes more often

and No less often than would be expected while the poor (C - to E) teacher said Yes less often and No more often than would be expected. The middle (B to C) groups show very little difference between obtained and expected frequencies relative to their size. One would conclude, therefore, that membership of such groups (drama and music) before coming to college was indicative of future success. Taken by itself such a result would be poor evidence for accepting or rejecting a student, but in conjunction with the many other pieces of evidence taken into consideration at the selection stage, it might be given its due weight.

The value of all such items according to the level of significance revealed by the chi-squared test is calculated below and a note of interpretative comment is added where appropriate. The items have been arranged for this purpose in four groups according to the results obtained: A. Highly significant items; B. Significant items; C. Items which produced results around the border-line of significance; D. Items which failed to discriminate between good and poor teachers (2). Tables are included for items in categories A and B only. The numbers and/or letters identifying each item correspond to those shown on the left-hand side of the questionnaire.

A. HIGHLY SIGNIFICANT ITEMS

Item 2. Sex

This is a less straightforward result than that of the example above. Men, relative to women, are found more often than would be expected in *each* of the extreme categories and less often in the average category. Women more often secure average teaching marks and less often secure either very good or very poor teaching marks. Notwithstanding the tendency of the men to be found either with very good or very poor teaching marks it is the unexpectedly large proportion of them with poor marks which is the principal cause of the significant result obtained.

The possibility that this interesting difference might be the result of differences in the distribution of teaching marks in the men's college and the women's colleges respectively rather than the result of any genuine sex difference was thought worthy of further investigation. First the relationship between sex and final teaching mark in a mixed college was evaluated. The resulting chi-squared showed no significant relationship. Next the relationship between sex and teaching mark was evaluated for the rest of the sample. This consisted of 523 students, of whom 92 were men drawn from

a college for men only and 431 were women drawn from various colleges for women only. The resulting chi-squared showed a highly significant relationship between sex and teaching mark.

The implications of this would seem to be fairly clear. The sex difference in final teaching mark noted in the complete sample is due not to a difference between men and women students but to a difference between the marking in the men's college and the women's colleges taking part in the investigation.

SEX				
	A to B +	B to C	C - to E	Totals
Male	16 (11.15)	87 (102.48)	26 (15.36)	129
Female	37 (41.85)	400 (384.52)	47 (57.64)	484
Totals	53	487	73	613

Chi-squared = 14.96 Highly significant

Items 6a and 6b. Pre-college teaching experience and its duration

Item 6a divided the students into Yes-No respondents. For the purpose of analysis experience of less than 2 months was counted as no experience. The Yes respondents were further divided by Item 6b into those who had 2 to 13 months' experience and those who had had more than 13 months.

The results show a significant relationship between pre-college teaching experience and final teaching mark. Those with previous experience were more likely to get high teaching marks and less likely to get low teaching marks than those without experience. Thus 133 students with 2-13 months' experience scored as many places in the highest category as 431 students without teaching experience. Or again, not one of the 49 students with more than 13 months' experience was placed in the lowest grouping of teaching marks.

PRE-COLLEGE TEACHING EXPERIENCE AND ITS DURATION

	A to B +	B to C	C - to E	Totals
13 months +	5 (4.24)	44 (38.93)	0 (5.84)	49
2-13 months	24 (11.50)	97 (105.66)	12 (15.84)	133
Less than 2 months	24 (37.26)	346 (342.41)	61 (51.33)	431
Totals	53	487	73	613

Chi-squared = 27.95 Highly significant

This result confirms some but not all of the findings of earlier studies in this field in England and Wales, though such studies are few in number and not always comparable with the present study. Turnbull reported a moderate relationship between previous teaching experience and final teaching mark in a sample of graduates of both sexes. Earlier Pinsent had reported a similar relationship, rather more marked than Turnbull's, in the case of men graduates only. Previous teaching experience seemed to have no influence on final teaching mark among the women graduates of Pinsent's sample. This sex difference, however, was not confirmed by the present study. Whether we take the mixed sample as a whole or the sexes separately the relationship between previous teaching experience and final teaching mark holds good.

Pinsent also discovered that the type of previous teaching experience was more significant than its duration. Experience of the un-certificated teacher type, where the student concerned had been in complete charge of a class, was found significantly related to final teaching mark by Pinsent, whereas experience of the student teacher type was very little related. It is not, unfortunately, possible to make any observation on this from the present study. An attempt was made in items 6c and 6d to make some differentiation in types of previous teaching experience, but the great majority of those with previous experience were in charge of classes most or all of the time and the number with experience corresponding to that of the former student teacher system was so low as to preclude any firm result.

It might not be inappropriate to conclude this section with an observation made by Turnbull in his study, namely that a fairer and more valuable comparison than the present one would be between students who had had a year's teaching experience followed by professional training and students who had had professional training followed by a year's teaching experience. "If it cannot be shown that the former are better teachers than the latter, then the system which causes a break in the intending teacher's academic studies is robbed of its main supporting argument and has nothing to recommend it."

Item 7c Jobs before coming to college and their duration

The results here follow the same sort of pattern already seen in relation to Item 2. Those who came to college straight from school obtained rather more of the average marks but fewer of the best or worst marks than would be expected. Those who had pre-college experience in some job other than teaching tended to obtain more

of the best marks and more of the worst marks also. The greatest single contribution to the significant result obtained was made by those students who had had more than twelve months in a job. They secured almost twice as many of the highest teaching marks as expected.

This result is generally in keeping with that of 6a/6b. Together they indicate the possible benefits and the possible dangers of taking employment before taking training.

J OBS BEFORE ENTERING COLLEGE AND THEIR DURATION

	A to B +	B to C	C - to E	Totals
Over 12 months	18 (10.55)	94 (96.92)	10 (14.53)	122
2-12 months	14 (12.54)	107 (115.20)	24 (17.27)	145
None	21 (29.92)	286 (274.88)	39 (41.20)	346
Totals	53	487	73	613

Chi-squared = 13.36 Highly significant

B. SIGNIFICANT ITEMS

Item 5. Membership of Drama or Music Group

This is the item which has been given as an example earlier. Of the 613 students 149 had been members of such groups. This membership was associated with more good teaching marks and fewer poor teaching marks than expected. The biggest contribution to the results was made by the relatively small number of Yes-respondents who ultimately got poor teaching marks.

It may be noted that no other item under section 5a or 5b proved to be significant. It was a pity, therefore, that in this Item drama and music were not separated. It may be that certain qualities required in dramatic performance are also required in teaching and that the teaching performances that influence assessment are particularly evocative of these qualities.

As the relevant table has already been given earlier it is not repeated here.

Item 7a. Whether straight from school or not

The table of frequencies for this item shows that those who came straight from school obtained appreciably less than their expected share of high teaching marks while those who did not come straight from school obtained proportionally more high marks. It

may be noted that there was almost no difference between the groups for low teaching marks. The result is in keeping with the trend already noted in 6a, 6b and 7 above.

WHETHER STRAIGHT FROM SCHOOL

	A to B +	B to C	C - to E	Totals
Yes	16 (26.11)	249 (239.92)	37 (35.96)	302
No	37 (26.89)	238 (247.08)	36 (37.04)	311
Totals	53	487	73	613
	Chi-squared = 8.45 Significant			

C. ITEMS WHICH PRODUCED DIFFERENCES AROUND THE BORDER-LINE OF SIGNIFICANCE

Item 3. Age

The tendency here is for the 18- to 20-year-old group (the bulk of the student population) to cluster around the middle teaching marks while the 21- to 25-year-old group (of whom there are 138) figure relatively more frequently in the extreme grades. The contributions to the significance figures are made most markedly by this latter fact. In the case of those students over 25 the low numbers involved must be stressed. There were only 41 such students in the sample and only seven of these figure in the extreme teaching grades. The low frequencies in the extreme grades do not warrant any pronouncement for this small group.

The general conclusion from this item would seem to be that acceptance at the conventional age of entry involves relatively less risk than acceptance of older candidates, who show a relatively greater tendency to do very well or very poorly.

D. ITEMS WHICH DID NOT DISCRIMINATE BETWEEN GOOD AND POOR TEACHERS

5a. Membership of Social or Youth Clubs.

Membership of Scout or Guide Movement.

Membership of Church Group.

Membership of other groups such as sports groups.

(The heterogeneity of the material under this heading probably does not permit of any very valid conclusion. The responses Yes/No, however, showed no significant differences.)

5b. Chairman or Secretary of Committee.
 Group Leader at Club or Scouting.
 Sunday School Teacher.
 Producer or Organiser.

5c. Representative of town, county or nation in any capacity.

6c. Whether acted as assistant to a regular teacher.

6d. Frequency with which student took charge of classes.
 (For the purpose of analysis the responses Never and Sometimes were lumped and so were the responses Most of the time and All of the time.)

7b. If male, whether done National Service.
 (Two men achieved commissioned rank. Both obtained B – for their teaching grade.)

9a. Father's occupation. (Occupations were categorised as follows:
 Class I Labourer.
 II Unskilled manual.
 III Skilled manual.
 IV Semi-professional.
 V Professional and Executive.
 VI Father deceased.)

9b. Family size.
 9c. Position in family.
 9d. Whether married.
 9e. If married, whether any children.

The failure of these items to discriminate between good and poor teachers is almost as interesting as the success of earlier items in doing so, since so many of them commonly occur on interviewing schedules. The results relative to National Service are especially interesting. Whereas previous teaching experience and previous experience in a civilian job both alike increased the probability of a high teaching mark, National Service does not seem to have done so. The small numbers involved, however, in the case of those who had *not* done National Service preclude any firm pronouncement.

5. SUMMARY AND CONCLUSIONS

A questionnaire covering five major aspects of pre-college experience was submitted to 613 second-year students (129 men and 484 women) in six training colleges. When final teaching marks became known, they were used to divide the students into three groups. The first group, comprising 53 students, was of those who

obtained teaching marks of B + or above. The third group, comprising 73 students, was of those who obtained teaching marks of C - or below. The second group contained the remainder. The purpose of this division was to facilitate the securing of unequivocal results for the students in the extreme groups, namely those who did well and those who did poorly.

The significance of the relationship between questionnaire item responses and teaching ability was evaluated through the chi-squared test and items were grouped according to the level of significance of the chi-squared results. Final teaching marks were used as the measure of teaching ability.

The small numbers involved in the extreme groups in the case of some items, the limitations of the final teaching mark as a criterion, the dangers involved in considering items in isolation, all make it most important to treat with caution the tentative conclusions summarised below:

1. Men, relative to women, were found more often than would be expected in *each* of the extreme categories and less often in the average category. Women more often secured average teaching marks and less often either very good or very poor teaching marks. This sex difference, however, would seem to arise not from a difference between men and women but from a difference between the marking in the men's college and the women's colleges taking part in the investigation.
2. Students with pre-college teaching experience tended to obtain high teaching marks relatively more frequently and low teaching marks relatively less frequently than those without teaching experience. This was true of both sexes.
3. Students with pre-college experience in some job other than teaching, relatively to those who came straight from school, were found more often than expected in *each* of the extreme categories of teaching mark.
4. Students with pre-college membership of Drama or Music Groups obtained high teaching marks more frequently than expected and low teaching marks less frequently, especially the latter.
5. Though the numbers involved were low and the level of significance border-line, there would seem to be a slight tendency for older students, relative to those of the conventional age of entry, to figure more often than expected in *each* of the extreme categories of teaching mark.

EDUCATIONAL REVIEW

6. Many items commonly used in interviewing schedules failed to discriminate between students securing high and students securing low teaching marks.

REFERENCES

1. The Training College Research Group comprises those lecturers in the Colleges in the Institute area of the University of Birmingham who are interested in educational research and particularly in research carried out collectively. It meets regularly during the academic year. Its composition varies according to the particular topic under review.
2. These groupings correspond to significance at the 1% level, 5% level, 10% level, and higher percentage levels than 10% respectively.

LIVING AWAY FROM HOME

AN EXAMINATION OF THE TREND IN STUDENT RESIDENCE (1)

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I

RECENT discussions of university education in the U.K. have, as is well-known, had to pay heed to notable facts reflected in certain statistical trends. The well-known "bulge"—the extraordinary number of births in the years immediately after the war—will five or six years hence ensure with a constant proportion of 17-19 year olds coming on to university, an expansion of about a third in the number of university students. There has, however, been an upward trend in the proportion of 17-19 year olds coming on to university. Widespread recognition of the necessity for more university education, particularly of a scientific and technical kind has been marked by a greater number of university awards from public funds and a greater readiness on the part of pupils at school, with the support and encouragement of parents and headmasters, to stay on in the Sixth Form to seek these awards (2). The motive of deferring with the possibility of altogether avoiding military service may be one influence which has contributed to this growing trend; that the trend has been as marked amongst women as men makes it reasonable at present to rate the motive a minor influence. The limited number of young people who can usefully benefit from a university education sets a natural (though vague) upper limit to this second trend. This limit is hardly yet approached and in present circumstances a limit of a social rather than a natural character is more likely to be reached (3). A third well-known trend has imposed itself. In recent years fewer and fewer students—despite the increase in their total numbers—have lived at home whilst pursuing their university courses. The problem of finding student living accommodation has been thereby complicated (4).

This article, on the basis of a rearrangement of the University Grants Committee's statistics on the residence of full-time students, attempts to develop the Committee's comments on this last trend

and to make a rough assessment of the impact of the trend on the problem of finding accommodation for students. The general importance of the problem of student residence needs no emphasis. For example, the unsuitability of place of residence is, in the minds of students, perhaps the most important single handicap to academic success (5).

II

In Table I three components of the trend, as affecting certain universities or groups of universities are distinguished: the rise between 1952-3 and 1956-7 (with a comparison with 1938-9) in the proportion of overseas students, the fall in the proportion of United Kingdom students attending their "local" university and the fall in the proportion of students with "local" homes who actually live at home. Multiplied together these last two components give the proportion of United Kingdom students who live at home; it is nevertheless useful to distinguish them.

TABLE I

PROPORTIONS OF STUDENTS: OVERSEAS, "LOCAL" AND "LOCALS"
LIVING AT HOME

	1938-9		1952-3		1956-7		<i>Students living at home as % of students with homes within 30 miles</i>		
	% Overseas students		% U.K. students with homes within 30 miles						
	1938-39	1952-53	1956-57	1938-39	1952-53	1956-57			
London	16.7	13.9	17.1	58.0	43.3	47.3	96.8	91.1	85.2
Oxbridge	12.0	11.0	11.0	—	5.5	5.3	—	40.0	27.0
"New" Universities*	(10.8)*	6.5	8.1	(46.8)*	23.2	18.0	(69.3)*	60.1	46.3
Older Provincial Universities	7.8	7.2	8.5	67.6	48.5	41.2	93.2	77.8	72.2
All English Universities	(12.2)*	10.1	11.6	(44.8)*	37.6	32.2	(92.4)*	80.8	74.1
Wales	2.2	3.2	5.3	67.3	48.2	40.3	69.8	64.9	57.7
Scottish Universities	6.1	7.1	10.3	68.6	64.7	63.5	94.0	95.3	93.3

* "New" Universities: Exeter, Hull, Leicester, Nottingham and Southampton. For 1938-9 only figures for Nottingham, Exeter and Southampton are available. This also slightly affects the comparability of pre-war and post-war figures for all English Universities. If only the post-war figures for the three universities above were used the purport of the table would be unchanged.

In England the rise between 1952-3 and 1956-7 in the proportion of overseas students more or less re-established the pre-war proportion but in Wales and Scotland brought it to a strikingly higher level. To distinguish overseas students is useful because finding suitable accommodation for them may often, unless they are given priority for places in halls of residence, prove more difficult than finding suitable accommodation for native students, and because with the development of university education in their home countries their numbers and composition are likely to be subject to different trends from those affecting native students. Nevertheless, because the number of overseas students is relatively so much smaller than the number of native students the fall in the proportion of U.K. students living at home is a factor of much greater importance to the problem of accommodation.

The number of Oxbridge (Oxford and Cambridge) students living at home has been and remains a very small proportion (1-2%) of their total numbers. At the other extreme the proportion of students attending Scottish universities who live at home has been and remains high. At the English universities other than Oxbridge and at the University of Wales the fall as compared with before the war in the proportion of students living at home has been marked and, as an examination of the intervening years in the 1950's will show, persistent. Both characteristics are equally true of the two components of the fall: the tendencies for students to avoid their "local" university and, if they do attend it, to live away from home are marked and persistent. These and subsequent statements must be interpreted in the light of the fact that, even for Oxbridge, the "local" element in the student population of universities continues to be larger than the proportion living "locally" of the total population of England would suggest. At least rough calculations with figures from the 1951 Census of Population indicate that about a quarter of England's population live within 30 miles of London and just over 10% within 30 miles of the "new" universities (Exeter, Hull, Leicester, Nottingham and Southampton). In 1956-7 the proportions of "local" students (those with homes within 30 miles) at the two groups of universities were nearly 50% and 20% respectively.

The definition of "local" as "within 30 miles" is necessitated by the form of the U.G.C.'s residence statistics. Presumably this distance was originally selected as usefully defining the outer limits of a local catchment area for students, not as the distance up to

which living at home would normally be feasible. Except perhaps in the London area (which may have been specifically in mind in choosing the 30 mile limit) living at home is manifestly convenient only where home and university are within very much less than 30 miles of each other.

III

What are the explanations of the marked post-war increase in the proportion of students leaving home? Prominent amongst the reasons why students do not stay at home is the lack at the local university of the required course. This reason is unlikely now to be of relatively greater importance than before the war—indeed rather the contrary. The change to be explained is a relative increase. It is a change which has taken place at a time of growing use by students of cars, motor cycles, scooters, etc., means of transport which have made the travelling of longer distances between home and university feasible—though not necessarily desirable.

One may confidently surmise that some part of the post-war change is simply the greater availability of grants making it possible for students with homes near the peripheries of university catchment areas and further afield to attend university—even if in many cases they avoid the local one. The “Welfare State” can reckon amongst its minor post-war achievements the severe reduction of the educational privilege conferred on some young people before the war by the mere fact that their homes happened to be near universities.

In addition to the spatial extension of the universities’ effective catchment areas there has also been the social extension, though it is a mistake to exaggerate it (6). More and more students are coming from homes which, because their members have had no previous experience of university education or because they are small or for many other reasons, are unsuitable bases for university studies and pursuits.

These two explanations of the greater post-war proportion of students living away from home would exist even if there had been no increase in student numbers. The increase which has taken place itself provides another possible explanation. Obviously the numbers of students at each university have not expanded in equal proportions. Conspicuously, London’s numbers between 1938-9 and 1956-7 rose by only 50% compared with a rise of nearly 90% for all English universities. Since the number of students with homes in the London area must have increased more or less in proportion to the

increase in the number at all English universities many of them (in fact about 4,000) who would have gone to London University had it expanded at the average English rate have had to go elsewhere. Taken alone this factor would account for about 5 points of the fall between 1938-9 and 1956-7 from 41% to 24% in the proportion of students living at home whilst attending English universities. But clearly it cannot be taken alone. Other universities in large centres of population (Birmingham, Durham, Leeds, Manchester (including the College of Technology), Sheffield, (though not Liverpool) have experienced larger than average expansions. There may be despite the London case (the facts are not available to determine the point), proportionately more university places within 30 miles of the homes of more students than before the war.

Another aspect of the increase in the numbers of university places is, one may surmise, more relevant here. The increase has barely, if at all, kept pace with the growing demand. In such circumstances candidates for university places have naturally begun to apply to several universities to enhance their chances of securing a place. Thus even if they live near a university the minds of many of them are from the first alive to the possibility of going to another. Moreover should a candidate really wish to go to his local university his qualifications may be inadequate for a place there yet adequate for a place at a more distant university from which he may thereby exclude a local candidate who in his turn may obtain a place at another more distant university. Strict limits on this process are obviously imposed by the narrow range of variation in standards of acceptance among universities.

A more obvious and perhaps more important explanation of the rise in the proportion of English and Welsh students living away from home is the relative increase in awards adequate enough to finance the positive desire of many of them, without much regard to home conditions, to leave home when they go up to university.

A quantitative assessment of these various explanations is impossible in practice and perhaps even in principle. Even to say the persistent decline in the percentage of "local" students living at home must be the consequence—at least in the London area where many more could conceivably live at home—of the desire, notwithstanding suitable home conditions, to live away from home is to say too much. The rise in the proportion of undergraduates' homes unsuitable as bases for university life must also play a part, perhaps a larger one, in this local decline.

On general educational grounds (encouragement to independence, new friends, fresh scenes) many warmly applaud the desire of students to leave their homes even though a consequence may be an exacerbation of the tendency for the universities of highest repute to "cream off" the best students (7). The desire, if they possess it, is presumably inhibited amongst Scottish students by the differences between Scottish and English/Welsh university education, the lower level of Scottish grants and the tradition, reflected in the procedure for awarding grants, that students should attend their local university (8). The comparatively slight decline since before the war in the proportion of students in Scotland who live at home (can one reasonably think?) is probably ascribable to the social and spatial widening of university catchment areas. Amongst the individual Scottish universities a marked change has occurred only at the rather special case of St. Andrews. (The figures unfortunately do not enable Dundee University College to be distinguished.)

IV

A rough assessment of the increase in the demand for accommodation due to the growing tendency for students to leave home is now attempted. The expansion of accommodation in halls of residence has been nearly in proportion to the increase in student numbers. In England only a slightly smaller percentage of U.K. students were in halls in 1956-7 than in 1938-9. (In Wales there was a fall of 10 percentage points.) The trend from home has been a trend into lodgings. In England before the war about 38% of students lived in lodgings; in 1956-7 nearly 55%. Five years earlier it had been 46%. In Table II an estimate of the increase in 1956-7 over 1952-3 in the number of students requiring lodgings—on the assumption that in 1956-7 the same proportion of U.K. students lived at home as in 1952-3—is compared with the increase in the number of students who were actually provided with lodgings. The difference between these two figures is finally expressed as a percentage of the estimated ("1952-3 proportion living at home") increase in lodgings so providing a rough relative assessment of the increase in the demand for accommodation created by the rise in the proportion of students living away from home. The calculation is illustrative and not precise. The detailed results, though not their general purport, would have differed if 1953-4 or 1954-5 had been chosen instead of 1952-3. There is no intention whatever of suggesting that the proportion living at home in 1952-3 is optimal or in any

TABLE II
INCREASE IN STUDENT ACCOMMODATION, GREAT BRITAIN, 1956-7 COMPARED WITH 1952-3
(ACTUAL AND HYPOTHETICAL)

	All English Universities	London	Oxbridge	New Universities	Older Provincial Universities	Wales	Scottish Universities
1. Actual increase in students 1956-7 over 1952-3	6847	1563	1380	1105	2799	422	1123
2. Estimated increase in U.K. students requiring accommodation assuming 1952-3 percentage living at home maintained*	3556	359	1213	799	1396	208	208
3. Actual students increase overseas	1740	866	141	176	557	119	580
4. Total increase students requiring accommodation (2 + 3)	5296	1225	1354	975	1953	327	788
5. Actual increase students accommodated in Halls	1870	564	518	274	514	254	259
6. Estimated increase in those requiring lodgings (4 - 5)	3426	661	836	701	1439	73	529
7. Increase in the number of students actually provided with lodgings	7406	2016	946	1040	3404	458	868
8. (7 - 6)	3980	1355	110	339	1965	385	339
9. (8 as % of 6)	116%	205%	13%	48%	137%	527%	64%

* In row 2 the estimated increases for the sub-divisions of the English universities do not total to the estimated increase for all English universities. This is a consequence of using, separately, percentages "at home" appropriate to all England and to each sub-division.

way desirable. The five-year period 1952-3—1956-7 is chosen as one of the quinquennia for which the government frames its basic financial plans for assisting the universities and on which the U.G.C., responsible for allocating the assistance, has reported.

The figures indicate how much in all groups of universities (except Oxbridge) lodging accommodation has been expanded over what would have been necessary if students had not increasingly been living away from home. In England as a whole the number of students in lodgings was more than double what it would have been and in Wales about five times more. This summary result for any university group, it must be remembered, is for a five-year period and depends on a number of factors, for example, the relative expansion as between 1952-3 and 1956-7 in numbers of students, the number of places provided in halls of residence, the proportion of students living at home in 1952-3 as well as the relative fall between 1952-3 and 1956-7 in this proportion. For example, the "five-fold result" for Wales just singled out largely follows from the fact that, had there been no growing tendency for students to live away from home, Welsh universities would have accommodated a larger proportion of their increased numbers in halls than any other group of universities.

V

As is commonly the case with summary statistics which are the resultant of numerous factors, the estimates and facts of Table II point no single moral. The availability of lodgings strikingly in excess of anticipation is perhaps suggested. On the questions most relevant to the future of the suitability of the additional lodgings—the limits in each university district to their availability, the possibilities of bed and breakfast lodgings—the figures, of course, throw no light.

Equally well the figures would support a claim for greater urgency and speed in building new halls of residence or the other kinds of university owned accommodation, now much discussed, such as bed and breakfast hostels combined with greater facilities at the university itself.

At the same time the figures are bound to suggest the question whether the growing tendency for students to leave home may not so complicate the problem of university expansion that the benefits which separation from home brings to students are, on the whole, stultified. How many students leave satisfactory homes near one

university for a life in wretched "digs" near another? If this is a valuable experience it is hardly one for a university to provide. The proportion of the homes of university students unsuitable as bases for university life may be rising but one must not disregard the fact that as a whole they are a very select group of homes. To say what is obvious that they are homes which have provided the backgrounds of successful school careers is to imply, with reference to the facts, that they are likely to be homes with small families, reasonably good material conditions and mothers and fathers who are sympathetic to and interested in the education of their children. The value placed (for many reasons) on education in their family circles is perhaps the most important single factor which distinguishes successful from unsuccessful pupils at school (9). All these characteristics are also important for success at university though there must then be changes in their form and extent. Undoubtedly in some cases they will cease to be adequately forthcoming to the university student if he remains at home.

On the other hand to say homes which have been "unnecessarily" left by a student son or daughter are, as a whole, more suitable as bases for university life than the vast majority of homes is not to say, what is really pertinent here, that they are more suitable than the majority of recent additions to university lodgings. Parental sympathy and encouragement can offset poor material conditions which to a student lodger would be intolerable. Some of the recent additions to university lodgings are homes which having lost a son or daughter to a distant university provide accommodation for a student at the local university. Such homes are, almost certainly, relatively few. The Lodgings Officers of English and Welsh universities have recently begun, as an experiment, to exchange with the appropriate universities the addresses of their own students whose homes are in other university towns. Partial statistics presented to the 1958 conference of Lodgings Officers suggest that an approach to these homes will secure about 10% of them as student lodgings. Some others, on their own initiative, will contact the university with offers of accommodation. Not all offers, it must be said, prove on investigation to be acceptable.

Perhaps headmasters could be made more aware of the problems of student accommodation at various universities and the dangers of prospective students spending their university careers in unsuitable lodgings. With such knowledge, faced by a prospective student vaguely eager to leave a suitable home within reasonable travelling

distance of a local university, a headmaster could, if he thought it wise, the better urge the case for the local university.

A change in the structure of grants is a matter of policy which *cannot* really be briefly, nor here competently, discussed. The present differences in grants to students according to residence in hall lodging or home have presumably the object, no doubt very imperfectly attained, of removing financial considerations from *choice of residence*. This policy has much in its favour though there are *conceivably circumstances in which one might* wish generally to encourage residence in hall. In the same way it is *natural for an* economist to think that the growing tendency for students to leave home might if necessary be checked or diminished by narrowing the differences between the grants given to students living at home and to those living in lodgings. To effect a change in a student's choice of residence by a change in financial inducements is, because the final choice is made by the student and his parents—the people most intimately concerned—the best device for effecting such a change. But its imperfections are obvious. Amongst the responsive homes would be those with a mercenary preoccupation with £. s. d., homes from which prospective students would usually be better separated. Moreover the growing tendency for students to live away from home is, as shown above, not merely a consequence of deliberate choices. The device would (inequitably?) favour the student who is able to satisfy his choice of living at home as against the student who would like to do so but is unable to secure a place at the local university. Furthermore the trend to leave home may be so powerful that it would not respond to practicable changes in grant differences: to give *larger* grants to students living at home than to students in lodgings would presumably be unfeasible. Nor can such a policy be seriously advocated without more information, for example on whether as the number of lodgings increases the proportion of unsuitable ones really does markedly rise and on how quickly accommodation in new halls of residence or hostels can be made available. Nor should it ever be advocated as more than a temporary expedient to abate for a year or two the demand for student accommodation whilst suitable halls are built. To suggest—this article does not *establish* the point—that there has been too great a movement from home to lodgings in no way denies the desirability of being able to offer most students for a considerable part of their university careers the full participation in university life which residence at university owned accommodation provides, a participation which,

it is widely agreed, will become more essential as university students become more fully representative of all social classes.

NOTES AND REFERENCES

1. In writing this article the author has benefited from discussion with Professor W. E. Armstrong, Dr G. B. Trasler and Mr S. I. Benn of the Economics Faculty, and Miss M. W. Price White, Academic Registrar of the University of Southampton. He is particularly indebted to Mr Benn for his penetrating comments on a first draft.
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TOWARDS LITERACY: ELEMENTARY SCHOOLS OF THE 1840's

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WHAT standards of literacy did the early H.M.I.'s find in the elementary schools of the 1840's? A study of the Report of the Select Committee on the State of Education, 1834, reveals much about attitudes, methods, and books used in the schools before the first State grant, and the Reports of the Committee of Council on Education indicate the progress made in the first decade of inspection by Her Majesty's Inspectors.

To those who believe it is the right of all, who have the ability, to become literate it comes as a shock to learn that in 1812 a tradesman could lose many customers because of his interest in reading (1). Even in 1833, when the State decisively entered the field of education and granted £20,000 for the erection of school-houses, we can still read of people of great influence who doubted the wisdom of allowing education to be given to all classes of the community. Indeed we are told that even the most enlightened felt that the education of the poor ought to be limited to the first rudiment of reading, as far as this was necessary for religious instruction (2). Many feared that knowledge "would produce a restless, dissatisfied and turbulent disposition averse to all inferior occupations, and that it would enable crime to be committed with greater dexterity" (3). Others believed that some learning would tend to elevate the minds of the poor. Mr William Allen, Treasurer of the British and Foreign Schools Society, told the Select Committee on the State of Education that he believed that persons brought up in ignorance were more under the dominion of their natural appetites and senses than those whose minds were cultivated. He continued, "The great point, with regard to the poor, so far as my observation has gone, is to raise them out of their degraded natural sensual state, and to give them a relish for the enjoyments of mind and intellect . . ." (4). The poor who lived in such a degraded state were so many (the years between 1750 and 1850 saw the population increase from six and a half to

eighteen millions) that philanthropic and religious people who thought like Mr Allen sought the quickest and cheapest means of teaching as many as possible to read and write.

The Report of the Consultative Committee on Books in Public Elementary Schools (1928) makes it plain that at the beginning of the nineteenth century there were very few books available for the schools of the mass of the population. Those books that existed were of two types: "On the one hand, there were the penny spelling and reading books, together with Catechisms and Abridgements of the Scriptures, published by bodies such as the Society for Promoting Christian Knowledge, for use in Charity Day Schools and in Sunday Schools. On the other hand, there was a considerable number of books designed primarily for children of the middle and upper classes, which had appeared as the result of a growing interest in home education (5)." One of the authors in the second class, Sarah Trimmer (1741-1810), founder of a Sunday-school in Brentford and an ardent supporter of Andrew Bell, also wrote books suitable for elementary-school education. These were used in Charity schools and Sunday schools and included a Scripture Catechism and two Abridgements of Scripture History.

Mrs Trimmer's *Charity School Spelling Book* was subtitled, "The Alphabet, Spelling Lessons, and Short Stories of Good and Bad Boys in Words of One Syllable only" and is worth studying as an example of a book in use in elementary schools of this period. It commenced (6) with a great number of meaningless syllables:

ab	eb	ib	ob	ub
ac	ec	ic	oc	uc

and without any intervening "real" words introduced on page 7 the difficult "ph" sound, still used in meaningless syllables:

pha	phe	phi	pho	phu
kna	kne	kni	kno	knu
gna	gne	gni	gno	gnu
wra	wre	wri	wro	wry
tha	the	thi	tho	thy
wha	whe	whi	who	why

On page 8, "real" words were introduced, but only in the same kind of list-form as that in which the syllables had appeared:

boy	joy	man	can	ran
hit	fit	pit	got	hot

By page 14 are found such difficult words as:

hymn comb dumb knell

On page 15 "Easy Lessons" were commenced and were written in the form:

A good man	A red cow
a good boy	an old man
a good girl	a tall tree
a bad man	a great oak

On page 16 we have the following sentences:

A good Boy likes to have a clean face.
A good Girl loves to be neat and clean.
It is a sad sight to see dirt on the skin.

All the lessons contained a moral and many of them read like sermons: "There is not a thought in our hearts but God knows it. We should take care not to say bad words, or do bad things lest we lose the love of God. If we have bad thoughts, we should try to get rid of them as fast as we can. You must take care not to lie or steal, for God will know if no one else finds you out. . . .(7)"

On page 27 began the "Short Stories of Good and Bad Boys", which were also designed to have a moral influence.

In the early years of both the National Society and the British and Foreign Schools Society, the fact that very few reading books were available for the mass of the population presented no great problem. For the National Society's part, the Spelling Books and Abridgements of Mrs Trimmer were thought to be sufficient for their village schools; reading in the British Schools was until 1839 limited by regulation to the Scriptures. The Kildare Place Society (a teacher-training establishment in Ireland) supplied the libraries of the British and Foreign Schools Society with some of their books. The Treasurer of the Society, Mr William Allen, told the Select Committee on Education that many of his schools were furnished with sets of Kildare Place Society books (8). He felt that there was room for a great deal to be done in providing "useful information" for the poorer class on a cheap plan. He went on to say, "I have put in my school at Lingfield a cheap edition of one of their little books, the *Farmer's Lad Richard M'Cready*, which communicates a great deal of useful knowledge upon the subject of agriculture and poor men's gardens, and things of that sort."

The Secretary of the British and Foreign Schools Society, Mr

Henry Dunn, had told the Select Committee, before Mr Allen had appeared before it, that, while the schools used no other books than the Scriptures, his Society had a library which consisted of books published by the Kildare Place Society. When asked by the Right Hon. Lord John Russell whether it might not be advantageous to introduce those books into the school instead of keeping them in the library for the children to read out of school, Mr Dunn replied that it might, but that there was some difference of opinion among friends of the Society as to the expediency of introducing books other than the Scriptures. When Mr Allen was asked a similar question he answered, "I do not think it would be necessary to insist on their being read in the schools, because that might take up too much of the time, and I should wish that the greater part of the time of schools, as far as reading lessons are concerned, should be occupied in reading the Holy Scriptures (9)." That this official policy was carried out in the schools was confirmed by one of the teachers, a Mr John Thomas Crossley, who told the Committee that he did not feel that there was a great need for elementary books of instruction, ". . . because we do not use any other book than the Bible (10)."

The Secretary of the National Society, the Rev. Joseph Cotton Wigram, was asked by the Select Committee whether the greater part of the reading in the National Society's schools was confined to religious books recommended by the Christian Knowledge Society. To this he replied that it was so (11). Thus we see that the two major forces in the day-school education of the working classes in the 1830's either used, in the case of the British and Foreign Schools Society, no books other than the Scriptures in school, or else, in the case of the National Society, confined the greater part of the children's reading to religious books recommended by the Christian Knowledge Society.

We should, of course, expect the Sunday Schools of the 1830's to use the Bible as their text-book for reading because their motive was precisely that of teaching children to read the Bible. When Mr William Freeman Lloyd, Secretary to the Sunday School Union, gave evidence before the Committee, he was asked whether children during the three years that they generally attended a Sunday School, acquired a competent knowledge of the art of reading. He replied that they generally did, but while they could read their Bibles they ". . . would be more puzzled with, as being less familiar with" other books (12). The Committee was also told that some pupils of the

Sunday Schools were taught writing on two or three evenings of the week. The Committee had earlier found from the evidence of the Rev. William Johnson (clerical superintendent of the National Society's Central School) that not even in the National Society's schools was writing invariably taught. In the rural districts, they were told, some schools did not teach writing. When he was asked if he had heard any reason given for that exception, he replied, "None, excepting that it might be abused; which in my opinion is a very poor reason (13)."

In 1840 the Committee of the Privy Council, appointed by Parliament in the previous year, appointed a number of Her Majesty's Inspectors of Schools. In a letter of instruction to these Inspectors, dated August 1840, the Council announced that their Lordships were strongly of the opinion that no plan of education ought to be encouraged in which intellectual instruction was "not subordinate to the regulation of the thoughts and habits of the children by the doctrines and precepts of revealed religion . . ." (14). From this letter we see that the Committee of Council intended to maintain the religious bias given to education by the National Society and the British and Foreign Schools Society. But this religious bias was not to extend as far as formerly. Many Inspectors were to campaign against the exclusive use of the Bible as a reading book and the absurd notion which resulted in little children chanting their alphabet as:

- A—is an angel, who praises the Lord.
- B—is the Bible, God's most Holy Word.
- C—is the Church, where the righteous resort.
- D—is for Devil, D is for Devil, D is for Devil who wishes us hurt . . . (15)

Some idea of the difficulties which these early Inspectors encountered and the educational views which they held can be obtained by a study of the Reports of the Committee of Council on Education. In the 1840-1 volume, for example, we find the first account of an inspection of Birmingham, Manchester and Liverpool by the Hon. and Rev. Baptist W. Noel, who began his account by attacking the exclusive use of the Bible in the teaching of reading. All the books on subjects with which children were most familiar had been excluded from the schools, and, with their natural thirst for variety frustrated, the children sank into an inert listlessness. But the worst effect of making the Bible the only class-book was that "it becomes associated in their minds with all the rebukes to which bad reading,

or false spelling, or inattention in class exposes them; and it is well if being thus used for purposes never designed it do not become permanently the symbol of all that is irksome and repulsive". He pleaded that the Government should offer prizes for the best class-books on various subjects and furnish these at a cheap rate to the schools.

At an inspection of the Midland District in 1844, the Rev. Henry Moseley found the reading lesson being used by some schools for the imparting of historical information. A knowledge of English history (which was, for the most part, "the lowest that could entitle it to the appellation" (16)) was acquired by using as a school-reader a book entitled *Outlines of English History*, published by the Committee of General Literature of the Society for Promoting Christian Knowledge. At the same inspection it was found that etymology was taught in a few schools. The Inspector commented that it was astonishing how entirely the meaning which a sentence was intended to convey might be quite beyond the understanding of a child who was yet familiar with the particular meanings and the derivations of the words which composed it. Thus, although etymology was taught to comparatively few children, the Inspector felt that it took up valuable time which could have been used to raise the standard of reading and writing. He concluded this section of his report with the remark, "My experience has convinced me that the necessity of teaching a child to comprehend what it is reading about, is not replaced by teaching it etymology."

All the schools which were inspected by the Rev. Henry Moseley were taught with the aid of monitors. In these schools, the master was employed, for the most part, in preserving order in the school, in examining the progress of the children of the lowest classes, and occasionally in teaching the first class. The Inspector concluded that the monitors were in reality the principal and most important agents in elementary instruction in its existing state. These monitors varied in age from 8 to 15.

The Inspector found that the employment of the Bible, or extracts from it, in teaching the children to read was almost universal. Of 103 schools from which he had returns, he found that no other books whatever were used in 69, and that in a considerable portion of the remainder it was only in the lowest classes that other books were used. He then made an observation which was to be applicable to many schools throughout the century, "The fact is that in the minds of these poor children no link has established itself between

the mechanical power to read and any pleasurable emotion derivable from it." This was no wonder in view of the fact that only one quarter of the schools had a lending library.

The following year's inspection of the Midland District, by the same inspector, did not indicate any major improvement in the state of things and only served to reveal in greater detail the low standard of the elementary education of the time. The Inspector now realised that a child taught only in the Scriptures appeared, in some measure, to have lost the ability to read when any other book was placed in his hands. The majority of the children he inspected had not acquired sufficient skill in reading to encourage them "to take up a book with the prospect of deriving pleasure or instruction from the perusal of it".

An even more depressing commentary was given on the state of class-books in the schools under his inspection. He frequently asked to see the stock of books. "I should in vain attempt to describe the feelings with which a man full of faith and hope in the cause of education may be supposed to contemplate that tattered assemblage of miserable pamphlets which was placed before me, with abundance of explanations by what shifts and contrivances these were made to serve the purpose of instructing, it may be, twice the like number of children."

In 1846, the Rev. Henry Moseley wrote that when he took into account that "teaching to read" was the principal occupation of the schools and that it was a drudgery begun on a child's entrance into a school and continued without intermission until he left, he found it "very wonderful that so imperfect and inadequate a result is maintained". With regard to writing, he could find only one or two instances where any attempt had been made to accustom the children to convey their own thoughts in writing on paper. The only purpose to which writing was applied in every other school was to teach the children to spell.

In an inspection carried out on the Schools of Parochial Unions in the Eastern and Midlands Districts between 1847 and 1848, we find evidence of an improvement in things. H. G. Boyer, H.M.I., had found on his first tour, like the Rev. Henry Moseley before him, that the schools generally had no secular reading-books. On his second visit, however, he found that the desecration of the Holy Scriptures, deplored earlier by the Rev. Baptist Noel, had been lessened in that the Bible was more and more being applied distinctly to religious instruction and less and less to service as a reading-book.

Furthermore, he found positive evidence that the children were beginning to understand the written language of their own times.

A study of the development of the teaching of English in elementary schools in the nineteenth century reveals how the teaching of English was gradually freed from restricting influences which beset it. The main aim of many people who promoted the early teaching of reading was not so much to teach children to read as part of a liberal education, as to enable them to read the Holy Scriptures. Even after the Bible and religious books ceased to be the main text-books for the teaching of reading, the readers which took their place reflected the attempt to influence the moral conduct of the child through his reading. By the turn of the century such direct moralising began to diminish. The moral approach became a broader one and instead of the do's and don'ts of the old readers there developed a faith in literature and poetry as civilising influences. The scope of English teaching was immensely widened as the narrower moralising influences fell away. Children then learned to read from passages which were selected for their literary value, and once they had learned to read, the Bible was not the only literary treasure which was open to them in school. Moreover, it was then possible for children to use their own resources in oral and written composition rather than repeat the moral precepts of their elders.

There were, of course, other restricting influences from which the teaching of English was slowly freed but the purpose of this article is to pay a tribute to the early H.M.I.'s for the progress made in the confining of the Bible to use only in the Scripture lessons. Two of the early inspectors mentioned above were reverend gentlemen who might have been forgiven for having some preference for the use of the Scriptures in reading lessons. But they saw that the use of the Bible in this way was educationally unsound. These men were pioneers who did much to influence the course of elementary education in their areas and they might have brought a narrow outlook to the problems of the schools. The evidence shows that they did not and that they well prepared the ground for two important steps taken by the Committee of Council on Education. In August and December of 1846 came the Minutes of the Committee of Council establishing the Pupil-teacher system that was to end the monotorial systems of Bell and Lancaster and bring a great change in methods of teaching. And in 1848 the Committee of Council on Education took the bold step of publishing a list of what it considered to be the best school books used in Great Britain, made grants for their

purchase and entered into an agreement with the publishers for selling them at reduced prices to schools under inspection. The Committee's moves and the inspectors' zeal brought about a diffusion of new books before mid-century and, one hopes, did something to raise the poor out of "their degraded, natural sensual state".

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YOUTH SERVICE QUANDARY

by G. A. GILES

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THE outstanding advance which the Albemarle Report marks is its unequivocal proclamation that the Youth Service is justified.

The Report recalls that extensive state provision for the social development, up to whatever age young people remain in full-time education at universities or other places of higher education, has been accepted by the country for many years, and the Report argues that it is only right to extend state provision to the less intellectual who have joined the ranks of factory, office and land workers.

But the Youth Service remains in a quandary, for, not unnaturally, the Report has been less precise in its suggestions as to how provision for the Service should be made. Discussion since the Report was published shows that the Youth Service is in a real danger of adding to, not ending, the "thousand natural shocks" that it is heir to.

Through the Report runs a red thread of inconsistency. It pleads, sensibly, for the "self-programming groups", and talks, disturbingly, of the adult's place in a club as that of a "wise parent". It emphasises the present-day needs of young people and wants to see more experiments "in the unconstrained way". It urges youth leaders to keep in step with the world of the young people around them, yet reminds them of "their own pastoral care". It looks forward to "an increasing independence, initiative and self-reliance in the young", but would also like to see more personal "counselling" of the young in groups of all kinds with knowledge of the individual circumstances of the young person and his home background. It demands "relaxation" as well as "challenge" for the young. It is all for new outside interests, yet suggests that leaders "will get to know increasingly the homes of *their* members whenever this is feasible" (my italics). The Report apparently approves that "the most important role played by adult leaders and helpers is that of parental surrogates, and their task is really family supplementation".

So it is not surprising that the Report has been criticised for its paternalism and its pandering to youth, for its timidity and its vagueness. It has rightly been praised for its compassion for youth and its broadmindedness.

In the comments and conclusions drawn from the Report two trends can be discerned: one clamouring for more and greater appeal to the spirit of adventure and idealism in young people, their readiness to help others in need and for self-sacrifice; the other in favour of abandoning all attempts at education in moral values or standards and set on sheer enjoyment without strings.

In the course of this discussion the attack has recently been directed by *The Times Educational Supplement* against the "traditionalists" in the Youth Service, and extravagant claims are made for the "new experimenters" who alone can bring salvation and will herald a dramatic rebirth of the Service.

On close examination, however, it becomes evident that much of this new approach is not as new as it appears to those who have only recently started to practise it; the underlying principles have years ago been preached and applied by the late Dr Macalister Brew, for instance. But in addition the new experimenters invariably reach the point of "what can we do? and how can we do it?" much as their forerunners have done. Nor are the "keynotes", proclaimed with so much emphasis, of meeting on "equal terms", of the image of an equal society with Christian names all round, and of "having mutual respect and confidence" as novel as they are made out to be. Many youth workers have spent much thought on these lines and have gained experience by trial and error, only to find that no hard and fast rules can be laid down and that the test comes after a good long time.

Any new and forceful drive for the sake of the Youth Service must be welcomed, yet any split into two warring camps competing for the meagre funds of the Treasury and local authorities—not to mention the voluntary workers required—must be avoided. Confusion in training of those in charge of youth clubs—hitherto called leaders and now relabelled "directors"—must be forestalled.

The facts are that the British Youth Service has deliberately been built up on the principle of unity in diversity and in opposition to uniformity. The ultimate aim has been to promote the growth of the individual and to cultivate freedom in community. Now comes a trumpet call for a uniform policy of "social activities to which no moral strings are attached".

The suggestion is made that the traditional clubs must "either adapt or perish"; it can only be retorted that the "new experiments" will also have to "adapt" or they may not flourish. There is in fact much common ground between the two schools of thought, which *could* and should move together rather than drift apart.

To pave the way both might do well to clear their minds on their basic assumptions about "them" and "they". Where the traditionalists speak of "their members" the new experimenters refer to "kids" and "teen-agers". Both apparently take it for granted that "they" are distinct from the adult involved in the youth group even if he (or she) is an undergraduate or "ex-teen-ager" of about twenty years of age. It is never suggested that the leader or director might identify himself with "them". In this both sides are in line with the Albemarle Report.

It is true that the Report professes belief in participation of the young and the sharing of interests between adults and young people. All through, however, it is implicit that the adults "have to offer" and to "hand on skills" and that the young only take. It is overlooked that in any youth group "of the right kind" the young do give by co-operating, by adding zest, by questioning and by contributing practical and theoretical knowledge, provided the adult is ready to take. Giving and taking, just as leading and learning, are wholly mixed up and indiscernible in the healthy pursuit of a common effort. There are only variations of mutual influence according to time, stage of development and opportunities. But there always is a spread of influence, for better or worse, and no adult will for long be a one-sided leader, helper, guide, director, advisor or friend.

This is no idle theory, but has been proved in many a camp, club, expedition, choral or dramatic society, jazz or brass band or other group. What is disturbing is that this plain truth—which incidentally is also borne out by the successful incursion of "youth" into the vast and varied fields of commercialised entertainment, football and innumerable leisure pursuits outside the Youth Service—should have been overlooked in the Albemarle Report and should now be in danger of being ignored or forgotten by both camps in their struggle for youth rather than with youth.

The crucial point, however, is this referring to youth as "them". This suggests the artificial building up of something like Hoggart's "composite dramatic figure", but not as described by Hoggart a "world of the bosses". Lord Stonham even describes youth as being apart from the community "activated by an exceptional capacity for enjoyment". Accepting this alleged difference and promoting it further the new experimenters demand for youth places of their own, "theirs to build or break", throwing the major responsibility for a dramatic rebirth of the Youth Service on to "them".

In the first place, there is no "youth" as a composite body for

which one set of Youth Service rules can be laid down. There are millions of young people with individual lives (past, present and future), with individual characteristics and with individual needs, many of which are much the same as they have been in previous generations. What the young have in common is that they are all growing into the adult world for which they are becoming responsible. They may be doing it at the same period, but they are doing it neither at the same speed, nor in the same way. There is a wide range of ability and behaviour from excellence to baseness. There still are enormous variations in environment.

The second fallacy is the assumption that "they" are so different from the rest of the community. The vast majority of young people to-day approaches "the strange and restive beast called Leisure with its unpredictable temptations and effects" as a new experience. It is significant that by and large leisure is a new experience also for their elders. Not only is leisure new, but also the money to spend on it, the hire-purchase facilities and a vast range of opportunities offered by novel advertising. In all these fields the young are recognised and welcome members of the consumer world as well as active participants in sports, entertainment, be it on the stage, films, television, on records or in live bands. They also travel abroad, enjoy the Wakes and winter sports, go mountaineering, fishing, yachting, to Butlin's Camps, to International Work Camps, to political and church rallies; they march and run the Land's End—John o' Groat's route; they join the Aldermarston marchers. They spend a lot of money on their enjoyment, but they also give to charities. (Few are the Fan Clubs without a good cause.) They render Voluntary Service Overseas. Because they are young and free from family responsibilities they often have more money and energy to spend than their elders. Because of their age they probably spend a little more for their mistakes in leisure choices.

But one thing is certain: for better or worse the young are by now well in and of the 1960 leisure society of Great Britain with all its abundance. The new experimenters no less than the traditionalists have to take this into account. Both groups will have to gear what they do to what happens outside youth organisations, or they will be out of step with events and retard the young in their growth. It is no good segregating "them" in "places of their own for them to break and to build". There must be interchange. It would be wrong to deprive the young of the experience and skills of their elders, waving the flag of a spurious freedom, and at the same time rob-

bing the rest of the community of youthful drive and inventiveness.

The directors in common with all youth leaders will have to watch out lest overemphasis on keeping the young to themselves keeps the experts away and makes it more difficult for the young to join the specialised sports and other societies which they want to join and for which they make good recruits even if they are not first class. The physical and mental resources of a place exclusively for youth are not likely, in the long run, to bring progress to "them" who want to improve their performance and to grow up in personal relationships.

What is needed is rather breaking down barriers and prejudices than erecting and creating new ones. Why should, in Lord Stonham's words, the "normally trained youth leader" be barred from the "Youth Ventures" outright and the young man be preferred "who has already established himself as leader?" To have established oneself as leader has long been recognised as a qualification for acceptance in a training course, and that course has often improved the leader's performance. He sets out to hold the ring rather than to be in the centre, let alone go ahead unless he demonstrates a skill. He is intent on spreading leadership, assigning it to different members on different occasions in different ways, always ready to take as well as to give. His hope is to have experts on tap rather than on top, to promote links all round and to expand the leisure experience of the young rather than to restrict it. He is ready to advise rather than direct. It would be a pity, and indeed a waste, not to give the "normally trained youth leader" a chance and to stamp him as a traditionalist unfit for a new experiment, when he knows that "the conscious aim . . . to make contact with them and to help them to help themselves" is barely a beginning and has become a cliché. Advising "the gang" on how to repair their motor bikes has been done in the past, but what needs doing more is guiding them on their motor bike jaunts, linking them up with the motor cycling ace and the adult motor cycling clubs.

Surely, there is no one new role for the youth leader of the future; as before, he will have many roles to play. Whether the emphasis is on the "new experiment" or on "tradition" will depend on the infinite variety of circumstances that arise in the Youth Service and on the young people themselves, whose unchanging human needs will persist in the years of their growth to maturity, and from whom there will emerge the Tommy Steeles and the Dennis Laws and also, of course, the sad and apathetic drifters.

BOOK NOTICES

A. E. TANSLEY and R. GULLIFORD, *The Education of Slow Learning Children* (Routledge and Kegan Paul, London, 1960, 28s.).

THE title of this excellent book defines its field. The idea that Education, in its full sense, is needed by the slow learner as well as by the swift, has some remarkable implications. Some were met implicitly by educational legislation in this century, but many have not yet gained the full attention of the teaching profession. The joint authors of *The Education of Slow Learning Children* are fully conscious of a problem that besets our schools from the humblest nursery school or E.S.N. school to our most opulent secondary school. Few children escape from the category "Slow Learning" in every respect. Tansley and Gulliford concentrate their attention on that 10 to 20 per cent of our child population which patently suffers from general educational backwardness. Much of what they say relates to practices which our best E.S.N. Schools currently offer to some of the 2 per cent of children "ascertained as best educated in a special school for educationally sub-normal children". If all E.S.N. schools absorbed and improved on the authors' suggestions, primary school teachers might take as much pride in getting a child well placed in an E.S.N. school as they do now in placing a suitable child in a grammar school. Desirable as that may be, unless our ordinary schools can meet the needs of the remaining depressed tenth of the child population, then society must eventually accept these children into the submerged tenth of the adult population. This book is not only addressed to the few who specialise in working with E.S.N. and more severely mentally handicapped children. It has something to say to every teacher who knows a child that does not do as well as he should.

Two chapters, "Special Educational Treatment" and "Aims, Principles and Organisation", should have the widest possible public. The suggestions given on class organisation, for example, would be a valuable check list to any teacher. Between these two, are three chapters dealing with the Intellectual Development, the Emotional Development and Physical Condition of E.S.N. Children. Here are clarified the ideas behind dozens of terms that are often misunderstood or ill-defined. Defining a handicap in such a way that it helps rather than hinders a handicapped child demands clear thinking. Typical of the workmanship in these chapters is the consideration given to the "Constancy of Intelligence in E.S.N. Children", which still demands further research, but enough is known and reported here to challenge some popular mis-

conceptions. The general thesis, that E.S.N. children have the same developmental needs as other children, will cause no surprise, but the corollaries here worked out will surprise and demand action.

Mental health is a world issue. Medicine searches for a break-through on mental deficiency. New theories and techniques will be brought for trial into our schools during the coming half century. These five chapters and the well selected further reading given at the end of each one, can help us to equip professionally to meet this challenge and to contribute to the improving standard of community care that is emerging. Although five chapters is tight space in which to outline big questions, they are clearly expressed, tribute is paid to past and present work and workers in the field, so that the authors are to be congratulated on their clarity, warmth and fairness.

The remaining seven chapters get down to practical business. The most important are the chapters on "Language" and "Education for Social Competence", for it is here that specialised schools can make the greatest contribution to children's development and justify their existence as best serving the interests of severely handicapped children. When ordinary schools offer the handicapped better help in developing language and social competence than special schools can, segregation will lose most of its supporters. The important place Tansley and Gulliford give to these two lines of development is a recognition of the vital part they can play in special school work. Most of their points are illustrated by quotations from everyday school life. How better could one express that limited language development puts shackles on the mind than by quoting this boy's oral description of his purchase of a kit at a model shop?

"Well I bought a . . . well I went into town. I went into this shop up in town with all those toys with yachts and I asked him had he got a . . . models of . . . big book of ships . . . drawings and he said "Yes" and I bought one. So then he said "Would you like this?" . . . all pieces of wood with like the shape of a boat that what I just needing. I said "Yes" and it come to 7/6d."

The authors give four causes of poor language development:

1. Poor background of speech and language at home.
2. A limited background of experience.
3. Emotional and social factors.
4. The limitations of the E.S.N. child's thinking.

They take great care to show how a school can help compensate a child on these four points and sketch out a language scheme. They emphasise the tremendous importance of this work as a basis for all educational development.

When basic communication has been dealt with, chapters on the Three Rs follow. On reading the authors sensibly choose to summarise the techniques of the best British and American workers. It is pleasing

to be reminded that we have Burroughs and Vernon to complement the *earlier American* work of Dolch, Gates and Witty. Briefly, the authors see reading as a part of language development, they give careful consideration to reading readiness, they welcome all "methods" of teaching reading at the right stage of development, and give a useful basic sight vocabulary as an aid in early reading. They stress the importance of reading comprehension, they say how the E.S.N. child might achieve it and give some useful leads on spelling. They analyse causes of failure and map out an approach to a problem backward reader. With Appendix B. this chapter makes a valuable contribution to the literature on remedial reading.

Tansley and Gulliford make it clear that the engineering of success in reading comes within the proper scope of E.S.N. school work; the interrelation between reading failure and behaviour problems is quoted in support of this judgment. Some special schools have, indeed, failed children on this very point. Nevertheless, having stated their case, they might well have pressed on to a bigger issue. It is in the lower streams of ordinary schools that one most frequently hears the suggestion that "dull children are not aware of their failings and that they can be happy through lack of awareness and through finding compensatory practical activities". The authors must know children reputed to be both E.S.N. and maladjusted who have really been deprived of the therapy of success in ordinary schools holding this false idea of the nature of dullness. A few such tragic cases quoted here with the neatness of other quotations would have served the cause of slow learners better. However, in establishing a sure place for remedial education in E.S.N. schools the authors imply its greater importance elsewhere.

On the teaching of number we are given a devastating case quotation to begin with. It is interesting to see how the current ferment in the teaching of mathematics working down from the universities has met a similar growth of ideas working up from the E.S.N. schools, where clear conceptions of number and the need for concrete manipulation of number spring from necessity imposed by limited intellectual capacity. This practical, meaningful chapter will be received with interest by mathematics teachers who rarely hear of E.S.N. schools. Despite this, what is offered here is very relevant to E.S.N. school work and most helpful. An indication of how E.S.N. children in practice adapt Cuisenaire and Stern material to their own needs would have rounded off an exciting chapter.

Chapters on "Creative Work" and on "The Growth of Knowledge and Awareness" necessarily deal briefly with a tremendous range of subjects. Even to mention beauty, appreciation, creative activity and awareness of natural environment in connection with E.S.N. school children is good in itself. There is much to be learned about the development of intelligence in so-called E.S.N. children by studying them in a controlled, varied, cultured environment.

The keynote to the chapter headed "Practical Subjects, Physical Education and Religious Education" is: "what stimulates creative activity and awareness, encourages mental growth". It is at this point that the book suffers most from overcrowding. What is said is sound but more could have been said about the contribution practical subjects can make to the whole range of educational progress. Insufficient space has been given to describing the freedom that can be offered in physical education to the reasonably healthy E.S.N. child. Too little has been said about religious education and the E.S.N. child. Examples from school life showing the ways in which an E.S.N. child thinks about religion and morality are essential to the discussion, even though the reader might be left to draw his own conclusions from the examples.

These faults are the result of compression. What blemishes the book has are redeemed in the fine concluding chapter on "Education for Social Competence" which was mentioned earlier. Attention throughout is focussed on how the school can help the E.S.N. child to grow up and take a responsible place in society. The chapter is based on factual surveys, it describes systems that are succeeding in practice. From the facts, the authors deduce principles which they codify under "School procedures influencing social maturity" including two meaty pages on "Discipline". What the post-school world actually offers the E.S.N. school leaver is also described but here, Tansley and Gulliford have courageously said what should be. This difficult exercise commands respect.

Finally there is an appendix on intelligence and attainment tests, a list of reading books graded for reading age and a scholarly index. I believe that the publishers will be surprised at the wide appeal this book will have. It will be essential reading in the training of special school teachers, most valuable as general reading for students in training colleges and it should find an important place in teachers', including head-teachers', professional libraries. When this is realised, perhaps the price will be reduced or the authors given additional space to expand their views.

J. E. MILES

BRIAN SIMON, *Studies in the History of Education 1780-1870* (Lawrence and Wishart, London, 1960, 37s. 6d.).

THIS book is undoubtedly an important one for all historians of education, because with a wealth of detail from contemporary newspapers and pamphlets, it charts the demands, first of middle-class radicals and then of the working class thinkers, for a national system of education.

Mr Simon has soaked himself, one sometimes feels drowned himself, in the polemics about education during these critical ninety years, and his range of printed sources is very wide. It is therefore more than a conventional and pedantic expression of regret to say how much one misses

a systematic bibliography, particularly since there is sometimes a certain lack of order in the footnotes, e.g. N. Hans, *New Trends in Education in the Eighteenth Century* (1951), obviously a key reference for Mr Simon's first chapter "Forerunners of Educational Reform, 1760-1800", is not mentioned until the chapter on the period 1800-1832. Nevertheless, Mr Simon has read a large number of unpublished theses, articles in a wide variety of periodicals both of the nineteenth century and the present day, and numerous biographies by and about his working-class heroes, in support of his case. For there is no doubt that this book argues a case and is not merely descriptive. Everything leads up to the final statement that:

By such means the way was kept open for later generations to renew the call for an enlightened education as part of the continuing struggle for socialism—for a society in which classes would be abolished and the opportunity for full human development made equally available to all (p. 367).

In support of his thesis that a really healthy attitude towards educational reform was preserved only by those working-class organisations which were undiluted by middle-class liberalism, Mr Simon produces a terrifying indictment of the Clarendon and the Taunton Commissions, for robbing the working-class of the charitable educational provision which had been made for them in earlier centuries, and for using the proceeds to finance better education for the middle-class. One cannot help but be persuaded in this instance by the evidence that Mr Simon has produced.

The first chapter "Forerunners of Educational Reform, 1760-1800" is the best short account yet published of the educational ideas held by the members of the eighteenth-century philosophical societies and their friends. It confirms, from another point of view, the findings of Mr A. E. Musson and myself, shortly to be published in *Economic History Review*, and suggests the need for even fuller investigations of the scientific education available in the eighteenth century to manufacturers and to the new class of engineers. It makes it quite clear that the Industrial Revolution was just as much an intellectual movement as the Scientific Revolution of the seventeenth century. N. Hans's pioneer work, however, which is of much greater length, still remains indispensable. Where Mr Simon adds to N. Hans's book is in his greater familiarity with provincial movements of thought, particularly in Manchester. He is less reliable on Birmingham, however, accepting the doubtful conclusions of R. E. Schofield about the membership of the Lunar Society and giving Edinburgh, instead of Marischal College, Aberdeen, the credit for producing William Small.

In his first chapter, on the eighteenth century, and his sixth chapter, on the late nineteenth century reforms of our universities, public schools and grammar schools, Mr Simon is at his best, and his realistic assessment there of the part played by political agitation in educational reform makes

refreshing reading, but his fourth and fifth chapters on the Workers' Movement and Education, between 1790 and 1850, are heavy going, largely because Mr Simon quotes so fully from working-class reformers who expressed themselves in the journalese of the time. Most Victorian polemical literature is tedious but Victorian working-class polemical literature, as represented in Mr Simon's quotations, is enough to turn one to stone. Though an argument can sometimes only be proved by weight of evidence, that method is excessively used in these chapters, and uncritically. The opinions of working-men are presented as though they were invariably correct while bourgeois authors' opinions are sometimes unfairly dismissed. Thus James Roebuck is quoted as saying that:

As the leisure class must, of necessity, be the most instructed, and as we should wish the most instructed to undertake the office of instructors, it is this leisure class that would in a good Government—always indeed subject to the control of the mass of the population—be the guides to the rest of the people in the business of education, as also of Government.

And this earns from Mr Simon the comment that:

This speech clearly expresses, once more, the abstract desire to spread enlightenment to all, elbowed out by concrete concern to drum only the right doctrines into people (p. 165).

Roebuck's opinion may have been as Mr Simon describes it but the quotation from Roebuck does not necessarily seem to support Mr Simon's assertion. Nor does much seem to be gained by quoting Marx as an authority on economic history (pp. 171 and 173).

In conclusion, I wish to stress again the importance of the book and its challenging character, but would also like to warn the reader that the book must be considered with an alert and critical mind.

ERIC ROBINSON

GEORGE Z. F. BEREDAY and JAAN PENNAR, *The Politics of Soviet Education*, (Atlantic Books, Stevens and Sons Ltd., London, 1960, 218 pp., 45s.).

IN recent years a number of books on Soviet education have been published in the U.S.A., including such competent and comprehensive studies as N. de Witt, *Soviet Professional Manpower* (1955), George S. Counts, *The Challenge of Soviet Education* (1957), Alexander G. Korol, *Soviet Education for Science and Technology*, etc. This, on the other hand, is a collection of essays written by eleven contributors (in connexion with a seminar held in July 1958 at the Institute for the Study of the USSR in Munich, Germany) and suffers from the inevitable scrappiness of a symposium. The essays which deal with specific points or most up-to-date develop-

ments will arouse, therefore, more interest than those which cover familiar ground. At present, the Soviet educational scene is dominated by the implementation of the 1958 law "on the strengthening of the bonds between school and life" and the concomitant re-training of teachers as well as its yet ill-discernable sociological consequences. These topics are discussed in the chapters by Richard V. Rapacz ("Polytechnical Education and the New School Reforms"), Norton Dodge ("Recent Changes in the Training of Soviet Secondary School Teachers"), and George Z. F. Bereday ("Class Tensions in Soviet Education").

Summarising the controversy which preceded the promulgation of the 1958 educational law, R. V. Rapacz outlines the conflicting views of those who wished to extend vocational training to all teen-agers at 15 plus and those who advocated an uninterrupted secondary education allowing for only part-time work in industry and on farms. "Economically, the return to polytechnisation has many common-sense foundations. . . . Industrial expansion of the type envisioned by Soviet planners demands a great increase in personnel with practical training, and a traditionally educated student hardly would be suitable for this type of work." Politically and socially, the law is designed to prevent social stratification since it requires that every applicant to an establishment of higher education spend at least two years in production. However, the author suspects that Party and technological elites will persist in their efforts to procure educational advantages for their offspring, and that the unaccepted proposal to provide special schools for the academically gifted was a device to this end "made despite adherence to the genetic theories of Lysenko and Michurin and the Soviet philosophical postulate that all children are equally educable".

The essay of Norton Dodge on the training of teachers is based on a comparison of curricula obtained by the writer during a trip to the USSR in 1955, when the length of courses in pedagogical institutes was four years, with the 1958 curricula obtained by the U.S. Office of Education delegation at a time when the length of training had been extended to five years; this is followed by a comparison with university syllabi designed for prospective teachers and including educational subjects such as psychology, didactics and teaching methods. The two major innovations in the new five-year programmes are: (a) a broadening of the fields of study enabling teachers to qualify in two or three subjects (a great advantage for small rural schools which cannot afford large staffs, and they are in the majority in the USSR) and (b) the inclusion of practical subjects. Thus, instead of specialising in mathematics only, prospective teachers now qualify in mathematics and technical drawing; similarly, training in physics and astronomy has been replaced by physics and the fundamentals of production; chemistry and biology by chemistry, biology and the fundamentals of agriculture; teachers of Russian are expected to have history or a modern language as their subsidiary subject. Graduates coming from universities take their major subject further than those

coming from pedagogical institutes, but the standards of the latter are considerably higher than those of British training colleges and approximate a B.A. degree in general subjects.

University standards are further discussed by Burton Rubin in the chapter on the University of Moscow, and the teaching of history and modern languages in those written by David Burg and W. K. Medlin respectively.

The sociological implications of the recent reforms have given rise to much speculations and in his essay on class tension, G. Z. F. Bereday attempts an assessment of the vexed problem of stratification in the USSR. Although Soviet educators strive to achieve an equalitarian society by fostering group loyalties, a single curriculum and co-education, political and economic forces may be working against them. High income differentials between skilled and unskilled workers and, in particular, between professionals and the rural masses favour the children of the former in the competition for university places. This is severe because university expansion is restricted to the needs of the economy. Children of the "new class"—to use the term coined by Milovan Djilas—benefit from attendance at better staffed and equipped urban schools, usually situated in major towns; they are more likely to gain admittance to privileged schools such as military schools and others specialising in foreign languages. Coming from similar income groups, living in the same residential districts, going to the same schools, these better off children develop refinement of speech, clothes and manners and, later, contempt for manual occupations. The less favoured masses may react by anti-intellectual attitudes and the feeling that education is not worth struggling for. This would "strike a blow at the heart of the bold design in the name of which the people in Russian lands, and through them indirectly people all over the world, have been so painfully uprooted. In this lies the greatest danger for Soviet education. . . . Soviet educators claim that their country cannot afford to train 'carpenters with higher education'. But if the equalitarian design of the Revolution is to be preserved, one wonders if they now can afford not to train them."

To close, one cannot help deplored a few misleading translations of some Russian terms, such as the expression "closed schools" for "boarding schools" or "schools for working-class and rural youth", instead of the more appropriate "schools for young workers and rural youth".

E. KOUTAISSOFF

W. E. FLOOD, *Scientific Words: Their Structure and Meaning* (Oldbourne, London, 1960, 18s.).

NEW words are often required for the communication of new knowledge. This is particularly true of scientific knowledge, in which new words are continually appearing, to the bewilderment of all except the specialist. Even among educated people there are many who adopt an isolationist

policy towards the language of science. This is most unfortunate at a time when the impact of scientific discovery is felt at all levels of society.

The book under review should do much to reassure those who doubt their ability to make sense of what is, to them, the "meaningless jargon" of scientific terms. This book is not a dry-as-dust dictionary of scientific words. In his new approach Dr Flood has arranged, in alphabetical order, more than 1100 "word-elements" (roots, prefixes and suffixes), which are most commonly found in scientific vocabularies. Examples are given of scientific and technical words derived from each of these word-elements, with notes on the origin and structure of each word. The list of examples in each group is not intended to be an exhaustive one, but the author has succeeded in making a well-balanced selection from the various branches of science.

The introduction, which deals mainly with the nature, sources, and formation of scientific words is most lucid and readable. The book should appeal not only to the scientist and student, who will find it a most useful book of reference, but also the layman, who will find in it much to allay his fears about the complexity of the language of science. In fact, all those interested in the written or spoken word (and that should mean most of us) will find this a most enlightening and satisfying book.

J. O. HUGHES

NATIONAL SOCIETY FOR THE STUDY OF EDUCATION. Fifty-eighth Yearbook (ed. N. B. Henry) "Personnel Services in Education", (University of Chicago Press, 1959, pp. xii + 303 + cv, 25s.).

G. W. PARKYN, *Success and Failure at the University*, Volume I, "Academic Performance and the Entrance Standard". (New Zealand Council for Educational Research, Oxford University Press, 1960, p. xviii + 254, 42s.).

At first sight these two books might seem to be strange bedfellows; in reality their juxtaposition is a sign of an interesting research tendency. The common subject is the student, but whereas Parkyn has him on the dissecting table (en masse), peering at the reasons for his disease or demise, the Yearbook is concerned with keeping him in scholastic (and indeed physical and mental) good health by the earnest offices of the guidance profession. British researchers into the relationship between student performance at school and success at the university are, except for one or two isolated instances, only just beginning to realise that correlation studies are too limited, and that they should be widened to include the whole educational milieu, including curriculum regulations, syllabuses and educational guidance.

In the United States of America, researchers in the same field realised this some years ago, as shown by the studies at Vassar, Princeton and Chicago. Guidance workers in the United States, approaching the problem from their own angle, have arrived at the same point, namely that

guidance is concerned with the student developing in his entire setting of home and university, rather than with the more static and isolated individual of earlier studies.

As a frank admirer of the best in American psychology the reviewer feels that he is not indulging in any narrow nationalistic bias when he says that any British editor would have condensed this Year book into half the space, with great benefit to the Yearbook. When voicing this criticism, however, it is only right that tribute should be paid to the service rendered by these publications in the past. Nor is the present volume one to be disregarded; there are parts which should be read by every worker in educational guidance.

The book has a very wide range—from an excellent chapter on United States' home and foreign policy and its relation to education, to a detailed historical account of the rise of educational guidance. Wrenn makes a gallant, but perhaps not very necessary, attempt to provide a philosophical background for personnel work. Later are mentioned in-service training programmes which involve the whole of the guidance staff; a wise move in such a rapidly changing world. This staff would include an administrator, psychologist, social service worker (graduate), remedial teachers, director of research, guidance director, consultant services, and—missing in many British universities—the necessary clerical help. In a good chapter by Borow we are told “the fact that the student is now more commonly studied in the flux of his social interaction rather than as a behavioural isolate has meant that personnel research has had to align itself more closely with the experimental social sciences”. A chapter by Pepinsky is useful for its account of the longitudinal case study researches now being undertaken on student development, including the production of “assessment models” of successful and unsuccessful students in various fields of study in the university. An interesting section by Dressel makes the point, ignored by some research, that the success or failure of an individual is predictable “only in terms of the kind of educational experience available in the institution”. This entails a detailed study of the experience as well as of the student.

Parkyn's work was undertaken at the request of the Senate of the University of New Zealand, and was aided by the Carnegie Corporation. It investigated the suitability of the standard of the entrance examination for admission to the university, and concluded that failures were mainly due to other factors. In line with the findings of recent research in other countries he concludes “the most promising approach to the problem of failure would, therefore, appear to lie in an attempt to discover the nature of those factors that operate at the university level to prevent so many students from achieving what it seems reasonable enough to expect of them”. The book is concise, with a wealth of carefully compiled tabulated statistics, but here and there more interpretative comment would have been welcomed. One quarrels with a few statements such as the idea that

because university teachers say that those students who fail are the ones whose work is unsatisfactory, and vice versa, "this is an absolute standard in a sense, for it takes no heed of the differing potentialities of students". This ignores the differences in standards in the minds of the teachers. Nor should it be stated, without qualification, that New Zealand women do better at the university than do the men. If they do so it is only because they are more finely selected. These however are small blemishes on a thorough and competent piece of work which should be read by all researchers on this and related topics, and by all those interested in education at the university level. Volume II, expected shortly, will seek to determine the causes of failure.

R. R. DALE

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EDUCATIONAL REVIEW

JOURNAL OF THE INSTITUTE
OF EDUCATION
UNIVERSITY OF BIRMINGHAM

EDITORS

E. A. PEEL
H. J. HALLWORTH
A. M. WILKINSON

FEBRUARY 1961

VOLUME 13 • NUMBER 2

UNIVERSITY OF BIRMINGHAM
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EDUCATIONAL REVIEW

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UNIVERSITY OF BIRMINGHAM

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REPAIR AND MAINTENANCE: A SURVEY OF TEACHERS' COURSES

by G. HINCHLIFFE

Lecturer in Education, University of Nottingham

The Climate

The last five years in education have been noticeably teacher-centred. Belatedly, there has been a realisation that the needs of the immediate, let alone distant, future can be met only if more teachers are recruited, effectively trained, adequately rewarded and fairly distributed. Better salaries and a greater range of opportunities, especially in the secondary field, have raised the profession's morale, whilst the increased provision for teacher-training and the introduction of the three-year training college course promise more enlightened staffing ratios and better qualified recruits.

It would be foolish, however, to imagine that all is now likely to be well. There is no certainty that these improvements will lead to higher standards of work. Above all it has to be realised that teaching standards are not self-perpetuating nor does classroom experience necessarily increase a teacher's effectiveness. It is important to devise safeguards against that weakening of efficiency which emanates from the inherent strain of a teacher's work. Educational policy must therefore remain teacher-centred, and gradually attention must be switched from the initial training of teachers to their further development. It is as important to maintain and to raise standards as it is to establish them. This would not appear to involve new policies since machinery already exists for these purposes. It is the object of this article to reveal how far this machinery is adequate for its functions and effective in fulfilling them, to consider what new demands may be made upon it, and to what extent it may be adapted or extended to meet new requirements.

The Needs

When a young teacher starts his career he possesses appropriate academic knowledge, some educational awareness and some teaching techniques. During his probation year and subsequently he will be

influenced in various ways by his pupils, colleagues, headmaster, local organisers and inspectors. Gradually, but fairly clearly after two years, a teaching pattern will emerge. This pattern will reveal either a teacher functioning efficiently in terms of his present abilities and experience-range or a teacher under-functioning in these terms. These contrasting patterns would in fact be apparent to any headmaster who cared to examine the character of his staff, and it is my belief that progressively the proportion of under-functioning teachers exceeds that of the effectively functioning. There need be no implications of negligence or apathy in this statement. On the contrary under-functioning is more frequently symptomatic of strain, over-work, unsatisfactory working conditions, and, above all, lack of further training. Almost all teachers pass through phases of under-functioning, but unfortunately many never emerge from them. Consequently to ensure a healthy, progressive teaching profession it is essential to provide opportunities whereby those functioning efficiently may advance their standards whilst those under-functioning may recover them. We must concede that the nature of the teacher's work is such that initial training must be supplemented not only by varied experience but by further training. The Ministry of Education, local education authorities, university institutes of education, and numerous professional associations offer courses for teachers of varying length, quality and purposes. How effective are they? What influence do they exert?

Ministry Courses

The Ministry of Education organises annually the following courses: Supplementary, Special, One-Term, Short.

The supplementary courses involve one year's full-time study, and almost all are organised on a specialist subject basis. They are additional to the normal two-year training college course, and they are available to students either as a continuation of the normal course or after an approved period of teaching. Invariably there are more applicants than there are places, and students are selected according to ability, but for the practising teacher the governing factor tends to be his local authority's willingness to second him on full salary. Increasingly, teachers have succeeded in securing their release, and whilst 710 teachers attended these courses in 1956-57, 890 were attending in 1959-60. Many of these were general subject teachers being converted to specialists of which there was a shortage.

With the full implementation of the three-year training college

course, the practice of students remaining for a supplementary year will presumably be discontinued. Many teachers will still be attracted, however, and the demand might well be greater, especially from two-year trained teachers with a few years' experience. If, as I suggest later, secondment is made easier, these courses can also play a large part in re-vitalising the under-functioning.

The Ministry programme includes special courses of advanced study for teachers. These are organised almost entirely by university institutes and departments of education, and they are intended to equip experienced teachers for more responsible posts (1). They last for one academic year and almost all of them lead to the award of a diploma and often to subsequent promotion or transference to specialised work. To be eligible for such a course a teacher must have not less than five years' teaching experience and must be a proved teacher of ability, although again, the valid criterion is whether he can secure secondment.

The most popular, and most ever-subscribed, courses are the Ministry Short courses. These are organised chiefly in this country during vacations, but in some cases abroad and occasionally in term-time. They are planned nationally and regionally, and are mostly of ten days' duration. The table on p. 86 reveals the character of these courses, their popularity, and some of the problems in meeting demand.

In 1957-58 48% of the teachers who applied for these short courses were unsuccessful, and 47% were not accepted for the 1958-59 programme. There are several reasons for this lack of success. First, to organise a course for between 50 and 80 teachers at a residential centre for a period of ten days is increasingly expensive, and this has tended to stabilise the annual provision of courses. Secondly, the Ministry reserves the right to assess the suitability of applicants for its courses. There must be evidence of "ability to benefit". Thirdly, the Ministry bears in mind the need for a balanced constitution of course members since the value of a course to an individual teacher is largely determined by the degree of "cross-fertilisation". Fourthly, to some extent the excess of applicants results from teachers applying for more than one course.

The principal disappointment each year is amongst primary school teachers. In 1957-58, 1168 primary teachers applied for eight courses. Of these 728 were unsuccessful (3). In the three years between 1956 and 1959 there was an annual rejection of between 60% and 65% of those applying for Ministry primary

TABLE I

AN ANALYSIS OF MINISTRY SHORT COURSES (2)

1956-57 1957-58 1958-59

<i>Nature of course</i>	<i>Number of courses</i>	<i>Attend- ance</i>	<i>Number of courses</i>	<i>Attend- ance</i>	<i>Number of courses</i>	<i>Attend- ance</i>
Subjects of the main school curriculum	28	1195	28	1334	30	1358
Educational and vocational guidance	3	145	1	77	3	139
Domestic subjects	3	153	1	79	2	109
Arts and crafts	7	409	4	321	6	349
For nursery, infant and junior teachers	7	378	8	440	8	421
Special educational treatment (backward etc.)	4	207	4	234	4	204
Technical subjects	29	1234	28	1192	21	1009
Adult education	1	105	1	111	—	—
Youth service	2	47	1	27	1	24

courses, a proportion which must have included many who would have benefited from further training. The difficulty for teachers at the moment is that the courses are not specific enough or plentiful enough for them to be discriminating in their choice. There is a need for more strongly biased courses (e.g. the teaching of a subject at sixth-form level, the teaching of a subject to less able children, the teaching of an aspect of a subject—grammar, local history, etc.). This clearer definition, coupled with wider provision, would lead to greater selectivity by applicants, less disappointment, and less likelihood of teachers concerning themselves with ideas and techniques for which they feel no strong need.

The University Institutes of Education

When, in 1944, the McNair Committee recommended the establishment of area training organisations and their institutes of education, its members envisaged that one of their principal functions would be the "further education" of practising teachers. It is true that many teachers had in the past studied for higher qualifications at the universities, but in the term "further education" was envisaged something wider and more flexible than specific study for additional qualification. Behind the recommendation lay the hope that the universities would in some measure be responsible for maintaining standards in the teaching profession. The university, through its institute, was for the first time to be the initiator of courses, conferences, study groups and working parties, whereby teachers could keep in touch with new ideas and techniques and also combine to solve common problems.

Most universities started their institutes in a comparatively modest way. Invariably accommodation was limited both in space and facilities, and staffs were recruited sparingly. In some cases the new responsibilities were virtually passed over to a slightly enlarged department of education. Indeed, the real extent of the new functions seems to have been barely realised, and the policies of several universities seem to have been inspired by the belief that the new rôles were largely administrative, mildly scholarly and could well be "played on the side". Even now, with a few remarkable exceptions, most institutes are retarded, despite imaginative direction and considerable industry. A much more liberal provision of facilities is needed if each university is "to give practical effect to its concern with education in the region of which it is the centre" (4). For example, when it is realised that most institutes serve areas which include three or four counties, employing 20,000 to 30,000 teachers, a minimum force of eight tutor-lecturers seems essential, yet only four institutes are at present in this position (5).

Despite the handicaps of the early years most institutes have exerted a growing influence and the following list indicates the range of their facilities, although few provide all of them in any significant amount:

1. Special courses leading to a definite qualification.
2. Short courses.
3. Study groups.
4. Conferences.
5. Working parties.
6. Advisory and consolidating facilities.

Special courses, organised by the institutes, have already been considered. Many institutes regard them as their principal teaching rôle. This is understandable since in this work there is continuity, sustained development, a recognised, although flexible, syllabus, and an examination which is a recurring measure of achievement. The benefits derived by mature students are great and are likely to have repercussions not only in their personal careers but also in the fields in which they move. The teachers attending, however, are hand picked and they represent in any one year less than a half per cent of the total teachers in any area served by an institute. Clearly, they are not the teachers whose need for help is greatest, and their education should be regarded as an important but not the principal rôle of the institutes.

The comparative brevity of the short course, its concern for the most part with subject teaching, its ease of accessibility, and its freedom from assessment make it the most popular of all the institutes' services for teachers. The following table indicates the scope of institute short courses. The four institutes represented here serve comparably wide, industrial-cum-rural areas, each with teaching populations in the region of 20,000. They are presented here to indicate trends and extent of influence:

TABLE II

SHORT COURSES AT INSTITUTES OF EDUCATION

Institute	1-2 days		2-10 days in term-time		2-10 days in vacation		Evenings (1/2/3 terms)	
	1956-57	1957-58	1956-57	1957-58	1956-57	1957-58	1956-57	1957-58
A	1	2	1	0	0	0	3	8
B	3	5	0	0	0	0	11	17
C	9	14	4	6	0	0	4	3
D	12	6	2	2	9	20	27	21

There is a general trend here towards evening courses, a trend apparent in the policies of almost all the institutes. Most of them comprise 10 to 30 meetings, and each involves 20 to 40 teachers in study, discussion and practical experiment. Second in popularity are those courses of one of two days held principally at week-ends. Some of these are residential and they usually involve larger numbers than the evening meetings. Efforts to organise long courses in term-time are apparent, especially at C. Some of these consist of consecutive week-ends, but a few are held for four or five days in school

time with the co-operation of local authorities. D makes a remarkable contribution to "in-service" training. It has a large teaching staff and has not hesitated to use its constituent colleges to serve the teachers on the fringe. Everywhere it was maintained that the problem of extending training facilities was as much administrative as pedagogic. Contact with teachers before and after courses involves larger administrative staffs than are available at present. This problem, anticipated by the McNair Committee, has not been tackled radically enough, and is a barrier to progress.

Conferences are often the sole contacts which many teachers have with their institutes, and so, although only a means to an end, they are valuable. The weakness of many conferences is that their members are denied the opportunity to confer. Instead, they spend their time listening and occasionally asking questions, to which, because of the pressure of time, answers are invariably given in general terms. Faced with this difficulty, institutes have experimented with the conference method, and the following is a summary of measures taken to make their conferences more effective:

(a) Many have extended conference time to two or two and a half days, and wherever possible have made them residential. The Leeds Institute, for example, has organised seven conferences a year during the past three years—four of them have lasted a whole week-end, and two of these have been residential.

(b) Audiences have been selected. In 1959 Leeds organised *post-graduate* conferences for *grammar school teachers*. London in 1958 organised a conference for *newly qualified teachers* and another for teachers of mathematics at *G.C.E. ordinary level*; Bristol in 1957 one for *headmasters*.

(c) The holding of mid-week conferences by some institutes has attracted wider audiences and has made liaison with university departments easier.

(d) Summaries of conferences, lectures and discussions have been circulated.

Conferences are starting-points. They mark particularly the start of relationships between the universities and an increasing number of people in almost every field who need the nourishment a university can give and who, in return, are able to stimulate the thinking and activities of those "within the walls".

Institutes provide facilities for consolidation of courses and conferences and they are sufficiently varied to afford each interested teacher freedom of choice according to his need. Study groups have

an increasing appeal. In general the initiative here comes from the institute but the development of such groups is through the pooling and examination of common experience. Stimulating, scholarly leadership is essential if these groups are not to degenerate into a haphazard exchange of prejudices, and it is in this way that institutes are exerting a growing influence. One of the most vital sustaining agencies of an institute is its library. In fact it may rightly be regarded as the most valuable addition to the educational facilities made available to teachers since the institutes' inception. The best of these libraries afford access to all significant educational books, journals, pamphlets and often to a range of school text-books. Most of them organise postal services whereby a teacher anywhere can acquire the book he needs within a few days. This is a particularly valuable service for those teachers working in remote areas, and gives real significance to the book lists provided at courses. A number of institutes have publishing facilities but the majority do not, and this is a possible future development. It is not only the formal journal that can be influential, but also the regular bulletin and pamphlet. Again, the chief handicap is lack of staff, for effective publishing cannot be the part-time task which it is at the moment.

It is clear that within the institutes there is a great potential for the good of the teaching profession. Institutes could be social, cultural, technical, inspirational centres, but no institute at the moment claims to be these except to a limited degree and for a comparatively few teachers. How can the influence of the institute be extended? It is essentially a matter of more power on the one hand, and more incentive on the other. Some suggestions concerning how these conditions may be achieved are made in the final section.

Professional Associations

Amongst the various assumptions underlying the planning of courses both by the Ministry and by the institutes is that the most successful course is the one in which teachers help each other towards higher standards. Active participation within reasonably sized groups is the basic method of a refresher course, and it is also the mainspring of the diverse professional associations in which teachers of common interest have grouped themselves.

At the present time over 80% of the teaching profession are members of the National Union of Teachers. Within its ranks are the representatives of every type of subject teaching and of every type of school. Most of its members, independent of their larger

parent organisation, belong to smaller associations which link teachers of specific academic or pedagogic interests. The frequency and extent of the meetings of these associations is dependent largely upon their resources. Almost all meet nationally in conference or at summer school and a fair proportion meet locally whenever need arises. All members maintain at least nominal contact through periodicals, pamphlets and correspondence.

The National Union of Teachers is a federation of local associations and consequently most of its conferences and courses are organised locally with appropriate financial assistance from the parent body. Much is left to local initiative and courses are designed to meet local needs. In most areas there is close collaboration between the union and local authorities, the latter often providing accommodation and assisting with staff for courses. Each summer the union organises residential courses in various parts of the country.

The following survey of the courses organised by a representative sample of the local associations of the National Union of Teachers indicates their wide range and their extensive influence (6).

TABLE III

COURSES ORGANISED BY THE N.U.T., INDEPENDENTLY OR IN
COLLABORATION WITH LOCAL AUTHORITIES

	YEAR	TYPE OF COURSE				TOTAL
		1-3 days meeting	1-3 days residential	Evening classes	3-7 days residential	
(a) by N.U.T. in 17 areas	1956-57	16	1	8	1	26
	1957-58	18	1	6	1	26
(b) by N.U.T. and L.E.A. in 9 other areas	1956-57	6	3	2	4	15
	1957-58	7	2	0	3	12

The figures indicate that popular form of N.U.T. refresher course, namely the large meeting for two or three days in which teachers attend lectures of general interest, and also choose one of a wide range of specific courses. Usually on these occasions, between 10 and 25 courses are offered, each run by nationally recruited experts. Prospectuses show that 80% of these courses are concerned with subject method, the remainder with special treatment (e.g. of the backward or maladjusted) and with topics of general interest (e.g. visual aids or secondary modern curriculum).

Attendances at these meetings vary between 500 and 3000, and it might be feared that such "jamborees" are likely to be too impersonal to be influential. The organisers, however, make every effort to ensure that they have a significance for each teacher. They recruit staffs of high calibre, they try to keep numbers in each specific course under 40, they provide for discussion by appointing a chairman of distinction to each group, they circulate synopses of each course well in advance, and they consolidate with exhibitions of books and equipment. They concede that for such a course to be a teacher's only annual course is undesirable, and, as can be seen from the above table, provision is also made for evening courses. These range from four to ten meetings.

It is impossible to assess accurately the number of teachers influenced by N.U.T. courses in any one year, for clearly the figures for teachers attending a particular course must include many who attend other courses, especially the large annual gatherings. However, it is estimated that some 50,000 members of the union attend a refresher meeting of some kind annually. These figures are significant when seen in relation to the N.U.T.'s total membership in 1958 of approximately 240,000 and the total teacher force in England and Wales of 307,845.

Professional associations other than the National Union of Teachers tend to fall into two groups. The first consists of those organisations which have annual conferences and branch meetings, and maintain contact with individual members through circulars and, in some cases, periodic journals. The second group consists of those who in addition to the above facilities also organise summer schools, short one- to three-day courses and provide regular bibliographies and postal advice to their members. Within each group there are wide differences in the quality of service provided. There are some annual conferences which are little more than business meetings, there are others where an intelligent exchange of views on topical and relevant issues takes place. There are branch meetings which are mere formalities, there are others which are the equivalent of one-day schools. Similarly, within the second group there are organisations providing one summer school a year and there are others providing a range of facilities to meet varying needs.

The annual activities of the following associations illustrate the work of the two groups, and are an indication of the degree of self-help which, within the clearly limited resources of most of these bodies, can be provided:

The Institute of Handicraft Teachers: Two summer schools. Postal course (with examination and qualification at the end). One-day meetings.

The Guild of Teachers of Backward Children: Several lectures (independently and in conjunction with the Special School Association). Bibliographies and postal advice. Annual Conference lasting two days (200 present). Publication of own journal.

Historical Association: Vacation school lasting ten days (70 attend).

Classical Association: Annual refresher course (two days—150-200 attend).

Association for the Reform of Latin teaching: Summer school—eight days.

Association of Women Science Teachers: One-day conferences—three times a year.

Several of the associations send out book lists and insist on preparatory reading for their summer schools, and a feature of some refresher courses is the demonstration lesson although this has tended generally to be out of vogue. Practical teaching, however, is sharply in focus at these association meetings, and at their best they are a good example of first-class teachers helping their colleagues towards higher standards.

Local Education Authorities

In theory, no teacher employed by a local authority need feel deprived of the guidance which will help him to greater efficiency and enjoyment in his work, since his employers are in the strongest possible position to diagnose his needs, to satisfy them and to consolidate or raise his standards. It is part of a local education authority's responsibilities to appraise teaching problems and to maintain a flow of advice and practical assistance to those in need. Apart from daily informal contacts through organisers and inspectors, their principal method is that of the organised course.

The following features have characterised local authority courses during the last four years:

1. There has been in every area a preponderance of courses designed to meet the current teacher shortage in the fields of crafts, music, physical education and science. Local authorities have sought to raise the standards of existing specialists and to convert semi- and non-specialist teachers for gap-filling rôles.

2. The majority of the courses are organised for evening or week-end attendance. Generally, residential courses are few in number and they are organised almost entirely in vacation time.

3. Staffs are recruited principally from talented teachers in the area, and the local organisers and inspectorate, who in most cases plan the courses, also assist substantially with the teaching.

4. Only a few local authorities have their own residential facilities specifically intended for the further training of teachers. The majority use training colleges, hotels, hostels and schools, and consequently course timing and duration are governed by availability of accommodation. Those authorities with residential facilities (e.g. the North and West Ridings of Yorkshire) testify to the resultant increased scope in course provision, and to the marked popularity of residential courses, amongst their teachers. These authorities have also discovered the advantages of residential courses in term-time.

5. With many authorities there has been an increased subtlety in the use of the course "weapon", principally by unifying course content and by securing strict homogeneity in course membership. For example, there has been an interesting extension of "adjustment" courses in the last two years for probationers, newly appointed headmasters, housemasters and careers masters.

6. Between 10% and 15% of the courses organised annually have been cancelled because of insufficient response.

7. Course provision has been greater for secondary teachers than for primary, and the proportion of secondary modern teachers attending has been greater than that of the secondary grammar. Few authorities provide courses exclusively for grammar school staffs.

There is a need for a larger number of more compact, local courses of reasonable length. At the present time there are too many which are fragmentary, episodic, and, in retrospect, superficial. **They may afford stimuli to the susceptible, but in terms of rehabilitating the under-functioning they are likely to have little effect.** Local authorities should aspire to adequate training centres for their "in-service" teachers, and be more systematic and positive in their course provision. Short secondment for a fortnight's full-time course at the local training centre need not be impracticable if appropriately timed, and the effects on teaching standards would be an encouraging return for the investment.

Power and Incentive

The foregoing survey and accompanying observations have been based upon the assumption that it is better for a teacher "in need" to attend an appropriate course than not to do so. It has been conceded that a teacher in difficulties can help himself, and that there are sources other than the course from which he can derive stimulus. It has been emphasised, however, that the unique characteristic of a course is its inherent group therapy. Self-help, mutual help, expert guidance form the flux of activity, and each individual emerges with a variety of new attitudes and approaches. Inevitably, the success of a course will vary according to circumstances and for each teacher who attends, but the following conditions are essential to success:

1. Each course must meet a real, not a hypothetical need.
2. Course members must have shared a common background and have experienced comparable problems.
3. The size of course groups should permit maximum "cross-fertilisation" of ideas.
4. A course should be of such duration as to afford adequate time for the *active* involvement of its members.
5. Within the limits of practicability, all courses should be consolidated.

Only a few of the courses encountered in the inquiry fulfilled all the above requirements, although machinery exists to safeguard them all. Inspectors, organisers and tutors are in contact with the teachers, the Area Organisation Standing Conference concert national policy in some measure, university institute planning committees bring together at a local level representatives of the teachers, of the authorities, of associations and of the universities. Much planning goes on, many needs are met, and yet there are strange contrasts and deficiencies in provision. On the one hand one authority organises a solitary course for teachers of the educationally sub-normal, lasting one day, whilst another holds a three-day course on bee-keeping. In the entire survey only one course was recorded as being specifically concerned with class order and discipline, only three with marking and assessing, surprisingly few with the difficulties in teaching adolescents, none with the rôle of the form master or mistress. Yet all these problems cause anxiety

to both probationers and to experienced teachers. Courses must be highly specific and relevant, especially when the time available is limited.

Both "group unity" and "cross-fertilisation" cannot always be secured by discriminating selection although the evidence of the survey suggests that where efforts are made to bring together teachers who are able to help each other to solve common problems they are well rewarded. But both factors seem dependent upon the fourth, namely that of course length, and with it, course integration. The effective teaching and successful working of a group are dependent upon continuity and time span. There must be continuity in the presentation of material, in student thinking, in idea exchanging and in practical application, and all these processes must occur within an adequate period of time if the appropriate maturation is to take place. There is a minimum unit of time essential to the success of any course. It will vary according to the course purpose and group size. For example, one would be sceptical about the value of a one-day course on "Music Teaching in Primary Schools", but optimistic about a one week's residential course on "Teaching English Composition in the Secondary Modern School". Unfortunately one- or two-day courses, or the equivalent in evenings or occasional lectures, are by far the most popular, and for many teachers they are the only courses they ever attend.

Merely to secure the attendance of teachers at courses should not be the aim. They must be the right teachers, attending the right courses for the right length of time. For most teachers effective detachment from their work is a pre-requisite to their course attendance. It is clear that the full-time course affords great advantages, whether "full-time" signifies a week, a term, or a year. Additionally, the full-time residential course is superior to the non-residential in terms of continuity, active involvement and maturation. Maturation within the limits of even a substantial course may be barely perceptible, although for most the process will start and for a few it will progress considerably. Its significance will depend upon subsequent experience and upon the degree of consolidation devised by the course organisers. There must be "follow-up" in terms of bibliographies and memoranda (and in some cases correspondence) for some time after a course is held.

What are the implications of the above remarks for those responsible for the organisation of teachers' courses? The following are my conclusions:

1. The Supplementary courses, which hitherto have been shared by training college students seeking a third year's training and practising teachers, should be maintained, and indeed increased in number, so that (a) semi- and non-specialist teachers who wish to develop a specialism may do so and (b) specialists in need of further training or "rehabilitation" may secure it.

2. For the above to be practicable local authorities must be prepared to second their teachers on salary in increasing numbers. The fact that many under-staffed areas have found it possible to do this in recent years suggests that such secondment is not as impracticable as many suppose. In addition to the year's secondment for supplementary and special courses, short secondments of a month or a term should be more frequent, and would be necessary if more full-time courses in term-time were planned.

3. There should be more encouragement, and again this means ease of secondment, for talented teachers to attend Special courses or to do research for higher degrees.

4. All local authorities should possess a teachers' training centre capable of accommodating 40 or 50 teachers, and they should increase their number of full-time residential courses (lasting one, two or four weeks) in term and in vacation time.

5. The academic and administrative staffs of the university institutes should be sufficient to ensure that contact between schools and universities is effective, that the demands of teachers for the various types of institute course can be met, and that through published matter all teachers in their areas, irrespective of whether they attend courses or use the libraries, can be informed appropriately of developments in their particular specialisms. In brief, the "education centres" envisaged by the McNair Report must become a reality in terms of influence exerted at the centre and on the fringe. In order to reach those teachers on the fringe of their areas, institutes should make greater use of their constituent colleges, and this might be done more effectively if one tutor were solely responsible for organising these extra-mural facilities.

6. As a guide, and for consolidation, the Ministry might well publish each October a booklet listing for certain subject groups (e.g. Sciences, English Studies, Crafts, Physical Education) all the residential courses available during the current academic year for which application might be made. They might include also lists of relevant recent publications, references to appropriate articles, and summaries of any significant experiments.

In order to achieve these conditions the further training of all teachers must be regarded as important as their initial training, the time available for further training must be more substantial, and more money must be made available. This increased expenditure need not be so great as to be prohibitive, and the increased advantages should justify the investment. In contrast, much of the expenditure on very short courses at present is wasteful and must bring small return.

The question arises as to whether, if secondment were easier, if one- or four-week courses, full-time, were more numerous, if education centres were an effective reality, teachers would be attracted. Just as the various authorities organising courses need more power, so the teachers need more incentive. The most praiseworthy incentive is the desire of the teacher to increase his own efficiency. It stems from self-criticism and self-respect. It is not, however, the strongest or most common incentive. The satisfying of ambition, the securing of promotion, the advancement of self-interest tend to be a teacher's strongest motives for seeking further training. There seems, therefore, to be merit in linking advancement with course attendance as well as with experience and competence in the classroom. This might be done, as in some American states, by a simple grading of teachers, each grade being attained after a prescribed period of experience and on the completion of a certain period of further training (7).

35 years ago the teacher's dilemma and its resolution were crystallised in the following diagnosis (8):

It is one of the first essentials of good teaching that it should come with freshness and vigour, yet the tendency of school teaching, year in year out, is to dull the teacher with its monotony and to narrow his interests to the ordinary school round. Most ways of life have their sameness, but there are perhaps few professions which make a more continuous tax upon the same powers or where the natural effect of monotony is more inimical to good work. Thirty or forty years in the classroom, teaching a succession of boys and girls known only for a year or two, individually different, but hardly different in the mass, and learning the same things, is a prospect calculated at times of depression to dash even enthusiastic spirits, is a prospect of difficult and sometimes worse than difficult conditions. Yet if the teaching is to be good it must proceed from minds actively interested, and continuously capable of seeing things in their right proportion. The mental tonic of knowing that, apart from the ordinary holidays, there is provision for some break in the monotony, which is not merely a break but also a means to better professional equipment, must clearly be of powerful effect, only second to the effect of such breaks themselves.

Unless the extension of education opportunity is to be merely statistically reassuring, future policies must include provision for the teacher, in detachment from his work, to renew his inspiration and his techniques. What may have seemed idealistic in 1925 is now a matter of urgency. Without it there can be no significant raising of our educational standards.

NOTES AND REFERENCES

1. They include courses in educational psychology, primary and secondary education, the teaching of backward, handicapped and educationally sub-normal children, and the teaching of such subjects as house-craft, religion and rural studies.
2. Extracted from Table 74, *Education in 1957*, p. 183, and Table 77, *Education in 1958*, p. 229 (H.M.S.O.).
3. Ministry of Education, Teachers' Short Courses, 1957-58 programme.
4. University of Nottingham, *Report on the Institute of Education for the Quinquennium 1947-52*, p. 1.
5. London, with its 5 professors, 5 readers, 22 senior lecturers, 35 lecturers and 1 research assistant, is unique, but its functions are much wider than those of the other institutes.
6. I am indebted to R. G. K. Hickman, Esq., Assistant Secretary, Education Department, National Union of Teachers, who, at short notice, dispatched a short questionnaire to local branch secretaries.
7. Possibly three grades: A—2 years' experience and 2 weeks' further training. B—5 years' experience and 4 weeks' further training. C—10 years' experience and a substantial course (higher degree; supplementary or special).
8. Board of Education, *Report of the Departmental Committee on the Training of Teachers for Public Elementary Schools* (H.M.S.O., 1925), p. 119.

THE PRESENT POSITION OF LATIN AND GREEK IN SCHOOLS

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OXBRIDGE'S recent decision to abandon Latin (or Greek) as a compulsory entrance requirement takes one stage further in the process, which has been going on for the last thirty years or so, of eliminating Latin and Greek as obligatory qualifications for entry to the universities and professions. Now in one or two universities only is "A" level Latin compulsory (e.g. London, for Honours English); five of the universities and university colleges (excluding Oxford and Cambridge) require a pass in "O" level Latin from all entrants to all Arts courses: five require a pass in "O" level Latin from entrants to Honours courses in English, History and Modern Languages; in the remainder, Latin is required for one or two subjects or not at all (1). In no profession, except the Church, is Latin or Greek indispensable for entrants. This withdrawal of external requirements coincides with growing demands for time and pupils within schools on the part of the sciences and, to a lesser extent, on the part of Modern Languages, especially German. Latin and Greek, therefore, are in the interesting position of having to stand on their own feet. How are they facing up to this new situation? Is there any change discernible in the numbers taking Latin and Greek, in courses offered, in aims and methods? The present inquiry was undertaken to provide some answers to these questions based, as far as possible, on factual evidence.

The evidence available was of five main kinds. Firstly, statistics and opinions contained in Ministry of Education published reports, or obtained from the Ministry. Secondly, information obtained from various examining boards. Thirdly, figures communicated by publishers for the sales of certain text-books, visual aids etc. Fourthly information and opinions provided by various Classical organisations and publications. Fifthly, data supplied by head teachers and senior classics teachers of eight maintained grammar schools in the City of Birmingham who, in interviews, kindly gave detailed answers to

a questionnaire. Information was also supplied by head teachers of one other maintained grammar school, two comprehensive schools and three grammar technical schools in Birmingham.

1. NUMBERS OF PUPILS STUDYING LATIN AND GREEK

(a) Latin

The most important evidence of the present position was very kindly provided by Mr C. W. Baty, H.M. Staff Inspector of Classics. His estimated figures, based upon an analysis of 100 grammar school reports in England and Wales during 1959, show that the peak in numbers is reached at 13+:

	11+	12+	13+	14+	15+	16 and over
A	23,547	73,601	73,754	47,447	33,582	17,260
B	27.4	60.5	51.7	35.4	27.3	12.55

A actual number of pupils studying Latin

B numbers studying Latin as percentage of all pupils of the year

From these figures several important facts emerge. About 36% of all grammar school pupils were doing Latin in 1959. Of those in the 13+ group doing Latin, about 35% will have studied it for no more than three years when they finish their Latin studies, and a very large proportion of this 35% will have studied it for only two years. In connexion with the 17,260 over-16 Latinists, it would appear reasonable to conclude, on the basis of evidence provided by G.C.E. "A" level statistics, that as many as 6,000 are following an "O" level course (2).

The only reliable evidence as to recent trends in numbers is supplied by the entrance figures for "O" and "A" levels of the G.C.E.:

	O			A
	No. of entrants in Latin	% of all entrants	No. of entrants in Latin	% of all entrants
1938	28,735	37.3	2,589	19.6
1948	35,330	31.2	3,790	12.8
1957	41,124	19.68	6,495	12.2
1958	44,163	19.64	6,496	11.4
1959	47,571	18.4	6,313	10.2

Thus, although the percentage of candidates taking Latin has steadily fallen owing to the very great increase in total numbers of candidates, the numbers of those taking Latin at "O" and "A"

levels have risen significantly in recent years, though the slight drop in the 1959 "A" level figure is to be noted. It is reasonable to infer that these increased numbers reflect increases in lower and middle school Latin. This is supported by evidence from the Birmingham inquiry. In seven of the 14 schools, important changes in numbers taking Latin have taken place in the last three years, or are now taking place. In three grammar schools Latin has been re-established as a major subject in the main school; in the three grammar/technical schools Latin has recently been introduced, or is now being introduced, for the first time. Further evidence is suggested by the increase in numbers of classics graduates in grammar schools from 2,015 in 1956 to 2,223 in 1959.

(b) *Greek*

Unfortunately statistics are not available from which a definite picture can be obtained of the numbers taking Greek. G.C.E. figures show a steady rise in numbers of entrants and a considerable decrease in percentage of candidates at "O" level, while there is an over-all increase in numbers and percentage at "A" level with a tendency for numbers to decline in the last three years:

	O		A	
	No. of entrants in Greek	% of all entrants	No. of entrants in Greek	% of all entrants
1938	2,049	3.4	881	2.2
1948	2,157	1.9	776	2.6
1957	2,412	1.5	1,578	2.9
1958	2,519	1.12	1,465	2.6
1959	2,601	1.01	1,413	2.3

A significant factor emerges when the numbers are broken down between boys and girls. The figures for 1959 are:

	Boys	Girls
O	2,096	505
A	1,215	198

This throws light on the precarious position of Greek in girls' schools and suggests that the present shortage of women teachers with qualifications in Greek is liable to become acute. Professor Kitto has suggested (3) that Greek is offered in 5% of all grammar schools. From evidence collected by the Classical Association from calculations based on G.C.E. figures and from the Birmingham inquiry (of the eight grammar schools of the sample, three offered

Greek), this figure now seems far too low. The present figure might well be nearer 20%.

The Spens Report in 1938 regretted "that the number of those who are actually studying Greek at present is not larger" (4). The Norwood Report in 1941 hoped "that wherever circumstances are favourable, opportunity will be given for Greek to be introduced for as many pupils as can derive real benefit from its study" (5). The Crowther Report in 1959 omits all mention of Greek. There does, however, seem to be a small but definite demand for Greek in schools. In one of the Birmingham schools of the sample the recent introduction of Greek in the fourth form met with a good response on the part of the pupils. In another Birmingham school the classics master teaches Greek in his dinner hour to a group of fourth formers. The fact that increasing numbers of Honours Latin students at the universities have to be taught Greek at the university suggests that the need for Greek in schools is not being wholly met.

2. COURSES OFFERED

(a) Latin

The most widely found course in the main school is the "O" level course of four years' duration, while in about a quarter of all grammar schools a five-year course to "O" level is offered. But for those who do not continue Latin as far as the "O" level examination, the commonest course is one lasting two years. A common pattern in 3-6-stream grammar schools is for two forms to do two years of Latin beginning in the second form, and for selection to be made at the end of the two years, usually on the basis of pupils' wishes and ability, of those who will go forward to "O" level after a further two years' study. The first two years of Latin, though catering for two distinct elements, those who will give up Latin after two years and those who will continue it, tends to be simply the first two years of the four-year "O" level course, with the weaker pupils often doing a watered-down version of what the abler pupils are doing. The Birmingham schools in the sample do not offer either a radically different course for those who will not continue their Latin after two years, or a clear-cut introductory course leading on to a second stage in the "O" level course.

The two-year course is, in fact, a fairly recent development. The Spens and Norwood Report do not mention it. Indeed the Spens Report simply recommends "that Grammar school pupils will begin Latin at latest between the ages of 12 and 13 and will have at least

about 4 years before they sit for the School Certificate Examination" (6). The Ministry's *Suggestions for the Teaching of Classics* in its 1939 edition does not envisage a distinct two-year course: "In the early stages of Latin it is the by-products which are valuable, and the by-products are many and varied. In so far as some of them can be realised, two years of elementary Latin are justified for those who then abandon it" (7). But "a two-years' course of Latin for a large proportion of unselected pupils, the majority of whom it is not intended to keep on to the later years of the course" is deprecated (8). In the new edition of the *Suggestions for the Teaching of Classics* in 1959 the changed situation is recognised: "If, however, the circumstances of the school make such a short course necessary, it must in fairness to the pupils be made as valuable as it is possible to make it" (9). It would appear, then, that the two-year course evolved partly under the pressure of early specialisation in the middle school, the need for extra science curtailing the Latin; partly as one solution of the difficulty summed up in the Crowther Report: "We think that Latin and 2 modern foreign languages is too heavily biassed a curriculum for many 'first-generation' grammar school pupils and for those who are going to leave at 16" (10) and partly as a result of the inability of some grammar school entrants to continue to progress in Latin, as at present widely taught, after the first two years of the language.

(b) *Greek*

The commonest course seems to be the two-year course begun in the fourth form and leading to "O" level. In the three schools of the Birmingham sample in which Greek is offered a two-year course to "O" level is in operation. The Ministry says, "There is generally no reason at all why such a course in Greek should be influenced by the Ordinary level examination; starting as it often does in the fourth school year, it can well be planned so as to lead straight on to advanced work" (11). But, small as the number is of pupils beginning Greek in schools, few teachers would agree to limit entrance to the course only to those pupils willing to continue it into the sixth; and often pupils and parents like the assurance of an "O" level pass before agreeing to an advanced course in the sixth.

3. AIMS IN TEACHING LATIN

No radical change is to be expected in a subject in which the influence of tradition is very strong. But aims are gradually being

adapted in response to a situation in which the main Latin course is shorter, the period allocation far less, the need for justification far greater than 30 years ago.

The first important change concerns Latin as a mental discipline, as an instrument for fostering accurate and logical thinking. As the experimental work on learning processes and transfer of training became more widely known, so the claims for Latin have been narrowed in recent years. "The Teaching of Classics", however, can still maintain in 1953, "As a subject for study by a wide range of pupils the disciplinary value of Latin—and we stand by the phrase undaunted by bogey words—is its greatest educational asset" (12). The minority group on the Crowther committee disagreeing with those who question the value of Latin in the junior and middle schools, by implication claim as a main value of Latin "training in logical thought" (13). In the Birmingham inquiry, of eight head teachers questioned three put mental discipline as their first aim in including Latin in the curriculum and two put it second. But a different view is expressed by the teachers themselves. Of the Birmingham senior classics teachers questioned not one gave mental discipline as his first aim and only one gave it as his second aim. In an inquiry carried out by Miss P. Winter in London into pupils' attitudes to Latin, Miss Winter concludes that classics teachers no longer make any appreciable use of the mental discipline argument in discussing values of Latin with the children (14). Similar conclusions were reached in research into children's attitudes to Latin carried out by one of the post-graduate students of the University of Birmingham Department of Education during 1959. But from these researches and from other evidence it is clear that classics teachers set great store by, and make frequent mention of, the value of Latin training in a more limited sphere as a help to modern languages and especially to English.

In fact, the contribution that Latin makes to the study of other subjects is regarded as a very important aim in Latin teaching by head teachers and senior classics staff. Even for those who do no more than 2-3 years' Latin, the Ministry points out, immediate contact with the Roman and Latin elements in our civilisation "gained by means of even a little knowledge of the Latin language, should impart reality and depth to much of the pupils' experience in other work—in English literature, for example, in French or in History" (15). In one Birmingham school Latin is taught in the first year by the history staff and is closely linked with ancient history.

Diminished emphasis is being placed, as would be expected, on the narrowly vocational value of Latin—as a “precaution” or qualifying subject. None of the Birmingham headmasters and headmistresses interviewed thought that Latin should be eliminated from the curriculum, or its scope greatly diminished in the unlikely and hypothetical case of the universities’ abandoning Latin completely as a faculty requirement.

Much greater stress is now being placed on acquiring the ability to read the language, to find out what is said in the Latin about the Romans and their civilisation, to enjoy the language and its content. The Birmingham senior classics teachers interviewed put this as their first aim almost to a man. The Ministry also leaves no doubt about this aim: “The first motive in studying a language is to acquire power to take in thoughts expressed in that language, to understand what the author has to say” (16). This desire to build up “facilitas” in reading Latin led Mr Leather, Senior Classics Master at Birkenhead School, to initiate a move in 1959 to abolish English-Latin translation as a compulsory part of the “O” level syllabus and to devote the time previously spent on prose composition to reading Latin.

4. CONTENT AND METHOD

In accordance with the changed emphasis in aims, the content of the Latin lesson has undergone a gradual but noticeable change. The reader or the Latin text in the course book is becoming more and more the core of the lesson, instead of an extra, thrown in to make up the odd ten minutes of a lesson. The criticisms of the Spens Report have had their effect: “We believe that the traditional methods [of linguistic teaching] are fundamentally wrong. In the emphasis which its exponents lay on formal and abstract grammar, they are apt to lose sight of the fact that language is not a series of formulae, but a living function of the mind whereby it expresses living ideas; and hence they are apt to destroy the pupils’ interest both in the ideas, and in the method of expressing them” (17). The very wide sale of *Latin for Today* (over 1,000,000 copies since 1932), *Approach to Latin* (over 500,000 of parts one and two since 1938), and *Civis Romanus* (130,000 copies since 1936) exemplifies and, in turn, helps to strengthen the modern trend. *Salve per Saecula, Alive on Men’s Lips* and *Poetry and Prose* represent a further development in which the scope of Latin reading is widened to include medieval and modern Latin (18). The desire on the part of many teachers to eliminate set books from the “O” level papers

—“the hollow sham of set books” as Mr Melluish termed it (19)—and the unanimous approval of all senior classics teachers interviewed in the Birmingham inquiry for the forthcoming abolition of the set book in the N.U.J.M.B.’s “O” level papers spring from a wish to read more widely, to read material that is more suited to the age and interests of the pupils than a book of Caesar and a book of Virgil. The Ministry, however, still feels it necessary to caution against “too exclusive attention to a ‘firm foundation of grammar’” and “an approach to the subject through the English-Latin sentence” (20). But grammar and syntax are now taught more closely in relation to reading, as supplying the keys to the Latin; while English-Latin translation is subordinate to reading Latin. Out of the eight Birmingham Senior Classics teachers interviewed seven put greater emphasis on Latin-English work than on English-Latin in the main school.

Related to this emphasis on Latin reading is the increased attention paid to Roman history and life, and through them to Greek civilisation. Evidence of this is supplied by the wide use of text-books mentioned above; by the appearance of new text-books dealing specifically with Roman life such as Milliken’s *The Roman People* (21); by the setting by various examining boards of papers at “O” level in Greek literature in translation and new papers in “General Classics” by Oxford and Cambridge and Cambridge Local boards; by the use of films and filmstrips; and by the flourishing condition and expansion of inter-schools Classics Clubs. Though these as yet reach only a small percentage of pupils, the possibilities of further development are suggested by the great success of the Penguin Classics some of which have entered the best-seller class (e.g. Rieu’s translation of the *Odyssey*, over 1,000,000 sold).

Direct Method teaching, measured in terms of numbers of teachers practising it, does not seem to have undergone any significant change in recent years. The writer of an article in the *Times Educational Supplement* estimated that some 30 teachers are using this method (22). Membership of the Association for the Reform of Latin Teaching is 375; *Principia*, the standard Direct Method textbook, has sold 20,000 copies and the second course, *Pseudolus Noster*, has sold 10,000 (23). These figures would suggest a far higher number of Direct Method teachers than is estimated in the article quoted. Interest in the Direct Method certainly remains strong. Nearly 300 teachers and students attended the week-end refresher course held by the A.R.L.T. last Easter.

English, however, remains the normal medium of instruction. But more Latin is now read and spoken aloud. Latin (and Greek) reading competitions are successfully held by branches of the Classical Association in several centres. It is significant that the first gramophone records of Latin readings to appear in this country for 25 years have just been issued (24).

In his survey of children's attitudes to school subjects in 1935, Pritchard registered such typical opinions to Latin as: "I cannot understand it however hard I try"; "All the books we translate into English are just very dull and there is nothing in them which makes you want to read more"; "By the time I have translated, I am too weary to appreciate the beauty of the Classics" (25). Latin's highest place in the popularity scale is with the 12+ age group when it is rated sixth in a list of ten subjects; with the 13+ group it drops to eighth; with the 14-year-olds it falls to the bottom where it remains. Winter's investigation into attitudes to Latin in 1951 reports that "hostility to Latin is widespread" (26). One-third to one-half of the pupils tested thought Latin one of the most difficult subjects. But there is some improvement noticeable in typical attitudes. There is a general desire to learn more of Roman life, in addition to the Latin language, and to read Latin written by the Romans themselves. In an inquiry carried out by a post-graduate student in the University of Birmingham Department of Education in 1959, of the total endorsements of statements by the grammar school groups tested, there were 1,265 endorsements of statements favourable to Latin and 1,425 endorsements of statements unfavourable to Latin. Some attention has of late been given to the importance of pupils' attitudes to the subject. Many Latin teachers try to make the lesson interesting and pleasant and a lighter touch is often discernible. Use of the Latin newspaper, *Acta Diurna*, the circulation of which has risen from 7,000 in 1946 to over 25,000 to-day, of games, songs and competitions of the type suggested in the *Friday Afternoon Latin Book* (27) is now frequently found.

In recent years, in addition to the work of Winter mentioned above, several interesting pieces of research into Latin teaching have been carried out including a study of group methods of Latin teaching (28), a study of error in junior Latin (29), and several studies concerning the teaching of Latin vocabulary (30). Garforth has pointed to the need "for research into the mental processes involved in the learning of a heavily inflected language" (31), and this need has become more urgent in view of recent developments

in theories of learning. Further research could be doubly useful in the present state of language teaching in schools. The acquisition of "the mastery of language" is unanimously recommended by the members of the Crowther Committee (32). But they are not agreed as to how this mastery may best be acquired. They point out that the present opportunity offered by the relaxation of external requirements for Latin "ought to be seized for rethinking the whole basis of the teaching of linguistics in schools" (33). Latin might well have a considerable and fundamental part to play in a replanned and, perhaps, more unified and simplified scheme of language teaching in schools.

NOTES AND REFERENCES

1. Latin (or Greek) is required for all Arts subjects at *Bristol, Exeter, Liverpool, London, Manchester*; all Arts subjects plus Law, *Bristol*; all Arts subjects except Geography and Economics, *Durham*. For French: *Hull, Leeds, Birmingham*: English, French, History, Italian, Spanish. *Leicester* and *Nottingham*: English, French, German. *Reading*: German, History. *Sheffield*: English, French, Spanish, History. *Southampton*: English, French, German, History. *Bangor*: English, French, History.
2. The Birmingham sample of eight schools, chosen almost at random, gives the following figures:

	11+	12+	13+	14+	15+	16 and over
A	210	382	228	262	258	102
B	19.0	30.6	22.0	25.8	25.8	11.9

A actual number of pupils studying Latin

B numbers studying Latin as percentage of all pupils of the year in the eight schools

It should be noted that whereas the national figures include independent, direct grant and maintained grammar schools, the Birmingham sample includes only maintained grammar schools. There are, of course, several independent and voluntary aided grammar schools in Birmingham in which Latin is a major subject. The Birmingham figures are interesting in showing a much more even spread of Latin over all years than in the national figures, with maximum numbers and percentage at 12+. The national tendency for a large proportion of pupils of 16 years or over to do "O" level Latin is confirmed; of the 107 16+ pupils, 63 are taking "O" level Latin, 39, "A" level. A further interesting point is raised by the position of Latin in the two comprehensive schools. Here Latin is taken by small groups (one group of 12 pupils in one, three groups of 17, 17 and 9 pupils in the other) consisting of proved linguists or/and potential Arts

candidates at the University. The impact of Latin can be calculated from the fact that these schools have 16- and 12-stream intakes respectively, one element of which is the equivalent of a 3-4-stream selective school.

3. "The Present Position of Classics in Schools and Universities", *Universities Quarterly*, Feb. 1955.
4. *Report of the Consultative Committee on Secondary Education* (1939), p. 234.
5. *Curriculum and Examinations in Secondary Schools* (1941), p. 121.
6. op. cit., p. 228.
7. *Suggestions for the Teaching of Classics* (H.M.S.O., 1939), p. 12.
8. *ibid.*, p. 13.
9. *Suggestions for the Teaching of Classics* (H.M.S.O., 1959), p. 13.
10. *Crowther Report*, p. 221.
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12. *The Teaching of Classics*, I.A.A.M. (C.U.P., 1954).
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17. *Report on Secondary Education*, op. cit., p. 16.
18. Gray and Jenkins, *Latin for Today* (Ginn and Co.); Paterson and Macnaughton, *Approach to Latin* (Oliver and Boyd); Cobban and Colebourne, *Civis Romanus* (Methuen); Pym, *Salve per Saccula* (Harrap); Pym and Silver, *Alive on Men's Lips* (Harrap); Hodge and Smith, *Poetry and Prose* (Allen and Unwin).
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20. *Suggestions* (1959), op. cit., p. 11.
21. Milliken, E. K., *The Roman People*. (Harrap)
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23. Peckett, C. W. and Munday, A. R., *Principia and Pseudolus Noster* (Wilding).
24. White, H. A. B., *Latin Readings*, Linguaphone Institute.
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26. Winter, P. E., op. cit.
27. Williamson, I., *The Friday Afternoon Latin Book* (Blackie).
28. Jones, I. W., *A comparative study of two methods of approach in the teaching of Latin* M.A. thesis, (Lond., 1949).
29. Gibson, D. A., *An experimental study of error in first year Latin*, thesis for Ed. B. (Glasgow, 1951).
30. e.g. Kilgour, A., *A study of the vocabulary of the Scottish Leaving Certificate in Latin*. Thesis for Ed.B. (Glasgow, 1953).
31. Garforth, F. W., "The teaching of Classics today", in *Studies in Education*, 2nd May 1955.
32. *Crowther Report*, p. 211.
33. *ibid.*, p. 211.

THE POSITION OF ENGLISH AS MEDIUM OF INSTRUCTION IN EMERGENT TERRITORIES IN TROPICAL AFRICA

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As there has been occasion to observe recently, the key to responsible self-government in Africa lies in an adequate supply of local men capable of taking over the work of the former colonial civil servant and specialist, without undue interruption of the countries' services and economy. It is obvious that there must be a sufficiently long period of preparation during which the future leaders of their state can be trained for their responsibility. It is likely that such a time will not only serve for the specialised training of a few, but also coincide with an expansion of general education at all levels, in an attempt to improve the standard of education in the country at large. Whilst the secondary schools will have the important task of providing those marked out for leading positions with a sound and balanced background of knowledge, primary education will henceforth have to supply the new class of literates, from which the "other ranks" of a country's economy, the foremen and overseers, the technicians and members of the public services will have to be recruited.

A considerable weight of responsibility will accordingly fall upon the primary schools of an emergent territory. Their task will not be made easier by the fact that rapid expansion of the primary education can lead to a considerable dilution of the available resources, in order to enable as many as possible to receive some sort of education. The employment of untrained teachers will become inevitable, new schools will be accommodated in make-shift accommodation and many children will have to manage without an adequate supply of books and materials. All these things will lead to a lowering of general standards. If it is accepted that in spite of these disadvantages it is better to teach something to as many children as possible rather than to produce a small well-educated élite, it will be

advisable to examine more closely what can be done to make teaching even under these circumstances as effective as possible.

Almost the whole of tropical Africa is, or has been until recently, governed and administered by a "colonial" power. The "official language" will have been the language of the occupying power, in most cases in fact either English or French. This official language will not only be the language of law and order, of business and communications, but also the language of education. The question will now naturally arise whether the language of the imperial power should be retained and if so, to what extent, or whether an existing or new local language should be groomed to take its place in the new national state.

In many parts of Africa pupils have a tribal background, and their language has a limited local application; very frequently they only have to move to the nearest large town to find that the speaking of their language is confined to the relatives they find there. (There are, of course, larger language areas in some parts of Africa, such as northern Nigeria and parts of east Africa.) Now when these children enter their primary school, they will in all probability be taught first of all in the language of the area in which the schools is situated, and if all goes well, there will be a gradual transition to the official language, at a stage which has been hopefully laid down by the local Education Department. Now this looks right and proper on paper in a syllabus or education report; in many parts of Africa however, such a policy of deliberately teaching in a vernacular first creates an obstacle in the path of learning, which many pupils fail to overcome successfully for the rest of their scholastic careers.

Many of the African vernaculars from the linguistic point of view are in an early stage of development. They have not been written down, at least not until the advent of the missionaries, and they have therefore no alphabet or any defined grammar, and their vocabulary is necessarily limited to everyday objects and occurrences. Now when a child enters school, he will have to learn to spell, read and write, at least to some extent, in his first year there. If he is taught in the vernacular, which may quite well not be his parental one, but that of the area in which his family happens to reside, he will read and write a language which has first to be written down for the very purpose of teaching the child to write in it, and which might well contain phonetic letters peculiar only to that language. As soon as he shows some mastery over this language (and sometimes sooner) he will be required to repeat that very process in

another language, which henceforth will remain his medium of instruction right up to the university—that is if he is clever and lucky enough to go there.

What will be the outcome of this policy? The pupils will have gained the questionable advantage of being able to read and possibly write their own language, in which there might only be a state-subsidised newspaper to read; subsidised because its readership would be too limited to make it a successful publication. On the other hand, they will have lost some valuable years in the study of the language that matters, the “official imperial” language, a loss which they are not likely to make good throughout the rest of their scholastic careers. Owing to a late start in that language (which we shall call English for the purpose of this article), selection for secondary education, where a minimum of understanding and expression on the part of the pupil must be presupposed, will necessarily be delayed (many teachers in Africa are familiar with the mustachioed youths and buxom wenches who are often to be found in the lower forms of the secondary school), and with it all further education and training. This leads to a loss in man-power which a new and striving nation can ill afford. If pupils had been taught *in* English efficiently throughout their school careers, an acceptable standard in English could have been reached correspondingly earlier, the school course could have been shortened and thereby badly needed places made available to more pupils.

That English will remain the language of higher education in (former) British territories—not only in Africa—for many years to come cannot be doubted. Nearly all text-books from the secondary school onwards are not only in English, but generally written for the native English pupil. It is therefore of particular importance that a child receives a sound basis of understanding of that language from his earliest school days. It is owing to the lack of precision in English that many promising school careers break down. To quote an example of lack of understanding and therefore clear thinking from a common entrance paper; a child asked for the chief export of his country wrote down as answer the name of the Governor. Obviously, the child had noticed the word “chief”, and without understanding the rest of the question had given the name of the “chief” of his country, the Governor. It is the precise thinking in a language which has to be taught, and which many of the vernaculars are not capable of transmitting.

English is, however, not only the language of education in

former British territories, it still is the language of everyday life with which the child, unless indeed he lives far out in the bush, will have had contact from his earliest days. It is the language of road-signs, of inscriptions on tins, of slogans on lorries, and in some form or other of communication between members of different tribal and language groups. It is the language which has supplied for the child's own vernacular a number of expressions denoting tools, implements and indeed manners introduced by the European. One has only to listen to a vernacular conversation at a local petrol filling station to become aware of this indebtedness. English is therefore not a foreign language to the pupil, it is a language which he will meet in whatever walk of life he might find himself; it is in fact his second language.

It has been argued that the immediate teaching in English in the primary school would stamp out local language and culture, and introduce an artificial way of thought. Certainly, where a vernacular is universally spoken over a large area and where it is sufficiently developed to rank as second or indeed first official language, a sound knowledge should be required from the schools, but even there secondary and certainly university education will be in English. Where, however, there is a fragmentation of local dialects, which are losing ground owing to a continuing process of detribalisation in the larger towns, it is not educationally sound to teach *in* an unimportant vernacular for mainly national or sentimental reasons. This does not mean that the local language should not be taught at all; it should be taught as a classroom subject throughout the primary school and, indeed, in the secondary school, if it can be taught at that level. Furthermore, a child will never forget the language of his home, his friends and the market, and if his letter home in later life will have to be read out by the village school teacher anyway it will make little difference if it is in the vernacular or in English. As far as other features of local life are concerned, such as local music and dancing, and local crafts, experience has shown that specialist teaching in local schools has in fact considerably improved their standards; they are of course largely independent of language teaching.

Finally, if it is admitted that the use of English as medium of instruction under the circumstances outlined above is indeed desirable, there still remains the question whether it is feasible. Indeed, a recent investigation (1) into this problem in the then Gold Coast recommended that it was not, although this was only a majority

view, at that stage in the country's educational development, although it was unanimously considered desirable. There were then some 10,000 pupil-teachers in the field out of a total force of 18,000, and their own standard of English was not compatible with the early introduction of English as medium of instruction throughout the primary school. But this low standard of English was surely the outcome of the policy of teaching a vernacular first? Teachers with poor English would prefer to teach in the language they knew best, with the result that their own pupils were not taught English properly either, and so the system was perpetuated. This vicious circle has to be broken, and though results are likely to be poor at first, better training, improved methods and a larger proportion of trained teachers is bound to have good results. A large proportion of untrained teachers is inevitable where an educational system expands rapidly, for it does not take long to build and open a new school, certainly not in the tropics, but it takes years to build, staff and equip new training colleges and to train the teachers. If the teachers there are trained, not to perpetuate an outmoded system but to introduce new and efficient methods, the teaching of English as a medium of instruction from the very beginning will indeed become feasible. In the particular case quoted above, the government of Ghana has in fact now taken this step, and therewith overridden local and partisan prejudice in favour of what would seem very sound educational principles.

NOTE

1. The "Barnard" Commission set up jointly by the Institutes of Education, University of London and University College of the Gold Coast, 1955-56 with special reference to the teaching of English and its use as the medium of instruction from primary class 1. Findings published by Government Printer, Accra, 1957.

ENGLISH IN THE PRIMARY SCHOOL

by DUNCAN CASE

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IT is an old adage that as a teacher one needs to know both subject and pupil, and knowing one's subject implies a knowledge not only of its technical implications, but more important, an insight into its practical value and adaptation to the stage of development which the particular group of children have reached.

Why do we need to learn (or to teach) English? For what purpose will it be used? What kind of English needs to be taught? Is the practice of speech, writing and reading more important at the primary stage than grammatical analysis? Will all children learn at the same rate? What kind of atmosphere needs to be created in the classroom? These are some of the many questions which the teacher will need to ask and attempt to answer before the general purpose begins to emerge—that is to teach his pupils to speak well, to read well and to write well. Speech, reading and writing—these three are the concern of the teacher of English.

Children are interested (i) in doing things, (ii) in announcing their doings, and (iii) in time learning of other people's doings. It seems obvious then, that we must provide things for the children to do. For some time before the primary stage "doing" and "announcing" in words have been infinitely more important than reading or writing—but now "things to do", while being immediately attractive, will also be permanently useful in the psychological sense, in that they will provide material for practical and vital living, both now and in the future.

Some of these activities to the outsider may appear trivial, but the teacher only has to look back on his own childhood to realise how important such seeming trifles were to him. Children do not change: what was vital to him is still vital to them. There must be something to imitate—from which to learn by example. There must be opportunity for constant practice, continual encouragement and constructive correction of error adapted to the children's stage of development.

In the Infant School the children made things for the joy of the activity but now they will begin to use their material with more constructive purpose and from centres of interest will develop speech work, reading for meaning, writing, dramatisation and story-telling (preferably narrative, of what has been done). Now the teacher's efforts will be devoted to making the most of what is being, and has been done. Reading and writing need to be made pleasurable and useful; kept as closely allied as possible to everyday interests and activities. Self reliance can be promoted without checking children's readiness to ask for help when they really need it, and opportunities provided for teamwork and encouragement given to children to find reading matter and written work for themselves, in addition to what has been put in their way in the course of work.

This, then, is the situation in which one may expect to succeed—both as teacher and learner. Now we can begin to answer some of the questions which arose earlier.

We need to learn (and teach) English in order to communicate not only one with another but with our environment. Our emotional outlet can be through the medium of the English subjects—our speech, writing (composition and poetry) and in reading, where perhaps the prestige of an author may help us to solve our own problems or where the acquisition and comprehension of a particular piece of knowledge may serve to increase our level of aspiration and thus decrease tension—e.g. gaining an insight. The kind of English needed to be taught will be dependent on the ages, abilities and aptitudes of the children and which particular stage of development they may have reached. The hope must be that the children will discover the need for certain standards of writing, speaking and reading. To make that discovery they must want to speak, read and write, and then be given the opportunity to do these freely. The teacher's job is to create the situation in which free "English" is natural and inevitable. Froebel expresses this in terms of "making the outer inner"—getting to know the world of people and things around us, and by "making the inner outer", by giving vent to all forms of expression and creation. Here is the "opportunity for constant practice" in its most natural and desirable form.

This is their chance to learn from experience and to set their own standards which must come before we attempt to impose our adult standards upon them. Here then is the answer to the question whether practice is more important than analytical understanding.

Still there remains the amount and the type of the kind of English we envisage. The amount can never be too much—of the teacher who prefers a single sentence, neatly written, to three pages of imaginative (if untidy) writing, little need be said, except that he is stultifying the fundamental creative impulse of the child who has something to say, sincerely even passionately. What is expected will depend on how carefully planned the stimulating situation has been—not only over a period of a week or term, but at all times. That the pupils have something to say worth saying, and know how to say it, is a prime concern of the teacher.

The question, "Will all the children learn at the same rate?" provides what is perhaps the major problem—that of catering for the differing needs of the children. The child who is a slow learner has the same fundamental needs as other individuals, although the means by which his needs can be met are necessarily different. His needs for belonging, affection and recognition are no different from those of other children and it is very often the inability to realise these needs that motivates much of the slow learner's behaviour. He needs the same balance between success and failure that all other children need.

In the beginning the slow learner in being taught to read, needs first to be taught to talk. All types of daily experiences will be required to provide the necessary stimulation to learning. In addition to the "big experiences" that make up the curriculum, the routine work of caring for pets, the garden, the unusual experiences of home and environment contribute to the child's background. The environment needs to be full of invitations to the child to employ any facility which may have been gained in reading. Making use of the oral language of the children in reporting or discussing everyday experiences is the best way, and at the beginning the only effective way, to build vocabulary. Slow learning children can never be expected to achieve much harmony with the world of books. Their world is primarily a world of first-hand experience—and these children need help to explore their environments fully.

In planning with children who learn slowly care needs to be taken in the moving from one experience to another. As they move they should be able to undertake new activities using the skill already acquired, but whether this will or will not be so depends on the relevance and meaning of the past experience to a new enterprise.

Consequently, the teacher must ensure that questions and comments bearing on the previous experience form an essential

part of the programme. Emphasis, too, will be laid upon the use of concrete, tangible or objective things which usually permit more demonstrating, constructing, picturing and dramatising as means of communicating ideas.

A sand-tray model of a farm, of a village or a fort, may be more convincing evidence of how well pupils know what they are talking about, or how an experience is affecting them, than mere verbalisation.

The slow learner learns in the same way, fundamentally, that other pupils learn. He learns from and by experience, he experiments, he generalises, he thinks and reasons, he plans and draws upon his past experiences. The teacher must know this and know his pupil to exploit these ways.

So it is then, that in the teaching of English—speaking, reading, writing—the way is being paved towards enlightenment. Through these means the individual may find a way out of his darkness and into the light of changing experiences which make up for the richness and fullness of a life. There is a need to know the subject matter necessary to meet these needs, and to understand the child in order to determine when and how he is best to receive the necessary training.

There is, however, a great gap between the laboratory and the classroom and much of the laboratory study of learning is, at least for the present, said to be without practical value. But what is of value is the recognition of the enormous complexity of the learning process, and the appreciation that there are no easy answers to difficult questions—and the knowledge that there is still a great deal to know about learning. It must, of course, be admitted that there are limits to what can be taught, that there are limits to techniques and that there are tremendous individual differences; and all problems are not going to be solved by "better teachers" and "better schools" even if it were known what made a "better" or even a "good" teacher. The great thing is that today teachers are asking more questions about their subjects and the children they teach.

The following five practical learning principles of Thorpe and Schmuller are listed to summarise the points intended to be made.

1. Motivation

Learning proceeds most effectively and tends to be most permanent when the learner is motivated, that is, when he has a stake in the activity being undertaken.

2. Adjustment to maturation level

Learning proceeds most rapidly and tends to be most permanent

when the activity involved is geared to the learner's physical and intellectual ability to perform that activity.

3. *Pattern Learning*

Learning proceeds most effectively and tends to be most permanent when the learner is provided with the opportunity of perceiving meaningful relations among the elements of the goal toward which he is working.

4. *Evaluation of Progress*

Learning goes forward with relatively greater effectiveness when the learner is provided with some criterion for indicating specifically what progress he is making.

5. *Broad integrated development*

Learning is facilitated when it goes forward under conditions in which the learner also experiences satisfactory personality adjustment and social growth.

SUGGESTED AIDS TO TEACHING. INTEREST TOPICS AND ITEMS

A Class Notebook or Diary. Class Newspaper. Class Wall News-sheet. Scrapbooks. Class Museum. Aquarium. Terrarium. White mice. Pond Life, Stick Insects. Model shop. Post Office. Bank. Campaigns: National Savings, First aid, Safety. Animal Defenders (R.S.P.C.A.). Model House. Weather Station (indoor and outdoor). Material from other lands. U.S. Embassy. Exhibits and displays on commodities (Cocoa e.g.). Local Map: Borough, Town, Village boundaries. World Stamps Map. Health and Hygiene. (Dental Care). Dental Board of U.K. Farm Adoption. Ship Adoption. Lifeboat. Holiday Postcard Map. I want to be a Nurse. I want to be an Engineer. Seaside Table. Zoo Animals. A Quiz Sheet in History, Biology, Geography—six questions per week. Arithmetic Quiz Sheet—six problems per week. Christmas Story. Easter Story. Guy Fawkes. Floral Arrangement. Sand Tray. Farmyard Models. Cars, Ships, Aeroplanes (models and pictures). Flower Collection—books. Fruits and Seeds (use egg boxes and label items). Growing Bulbs (Cress on blotting paper, bulb in glass). Pen-pal Corner. People and Occupations (weekly or monthly feature). Films: strips, slides and sound films. T.V. Corner. Puppet Theatre. Dressing-up box or cupboard. Prayers and Hymns for the week. Poets' Corner. Artists' Corner. Craft Corner. Library Corner and Table. (Quiet Corner). Telephone (and Directory). Weights and Measures. Scales. Suggestion Box. Post-Box.

IRREGULAR ATTENDANCE OF CHILDREN AT SCHOOL

by LESLIE RANKIN

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EARLY in the eighteen-seventies one of the first acts of the newly appointed School Boards was to appoint officers to enforce the attendance of children at school. It is still necessary for officers to be so employed. There has been a vast improvement in the parental attitude to compulsory education but there still remains a hard core of parents who have no enthusiasm for education and there are instances where they are actively opposed to their children attending school regularly.

Usually the children with the poorest school attendance records are the least able academically. Their parents do not encourage them to attend school and frequent absence causes them to fall further behind with their school work. This vicious circle can only be kept within reasonable bounds by the unflagging efforts of the Education Welfare Officer. Since the end of the last war another factor has come into being—the employment of a large number of married women. An ever-increasing number of children of secondary school age, the majority of whom are girls, is kept from attendance at schools for domestic purposes—caring for younger children, preparing meals for working members of the family, nursing sick relatives, waiting at home for the rent or “Club” man to call. In fact any domestic crisis, major or minor, appears to be met by keeping the eldest school child away from school.

Recently a parent appeared before a court to answer a summons in respect of the absence from school of a child for a period of four weeks. She said that the girl had been kept at home to care for two children aged two and three years while she, the mother, went to work. Asked if she could not make other arrangements she said that she could, but did not propose to do so as it would cost about fifty shillings a week to have the children minded. The maximum penalty for a first offence (20s.) was imposed. After the hearing the woman

informed an officer of the local authority that she was well satisfied with the result. However, a second appearance before the Court and the imposition of the maximum penalty of £5 caused her to change her attitude towards her daughter's attendance at school. The child had, unfortunately, lost more than two months' attendance.

There are few attendance problems in the primary schools. Apart from the children who come from the homes of the "hard core" families most of the pupils attend school regularly. There is, however, a small group which presents officers with difficulties—children whose mothers are over fussy or possessive and cannot bear to have their children out of their sight. Recently there has been an increase in the number of infant children sent to school when obviously they have not been fit. They come from homes where both parents are at work and it has been necessary to remind them of their obligations to their children.

The officers of Education Authorities responsible for ensuring the regular attendance of children at school have for some time been concerned about the poor attendance at secondary schools. They have been aware of the position in their own areas but no statistics have been available with regard to the situation nationally. Hundreds of millions of pounds annually are expended on education but the Minister of Education does not require to be informed if all the children are receiving the fullest possible benefit from the facilities available. It may be that the Minister believes that this duty lies with the local Education Authorities; but a number of Authorities no longer require to be informed of the percentage of attendance at the schools in their areas.

In an endeavour to remedy this lack of information the Association of Superintendents of Education Welfare and Attendance Departments decided to attempt to collect material which would enable them to make an assessment of the problem. A questionnaire was circulated to all Education Authorities seeking their co-operation. More than 50 Authorities supplied information—37 of whom provided statistics in the manner required.

The Authorities were asked to supply figures in respect of the various types of secondary schools and all-age primary schools. The average number on roll and the percentage of attendance for the three months—October, November and December, 1958—was requested under the following headings: Grammar, Technical, Comprehensive, Multilateral, Bilateral, Modern and Senior pupils in all-age primary schools: the figures in respect of Modern schools

to be broken down into Mixed, Boys and Girls Departments. In addition, information was sought with regard to the percentage of attendance of the individual academic streams in the Modern schools.

The 37 Authorities who supplied full information were concerned with the education of more than half a million children of secondary school age.

The reason for selecting the autumn term for the purpose of this review was that, generally, the attendance of children at school in this period is less likely to be affected by loss due to severe weather conditions and epidemics, which are encountered in the spring term; or by parents' holidays, which affect attendance in the summer term.

Also included in the questionnaire was a request for information with regard to the regularity of attendance at school of delinquent children, together with a record of the academic assessment of such children. It was anticipated that such information would be available to only a few Authorities. Complete information was, in fact, provided by 12 County Borough and 2 County Authorities.

A brief summary of the information gathered is set out below.

	COUNTY BOROUGHS	COUNTIES	COUNTY BOROUGHS AND COUNTIES
	Average number of on roll	Average number of on roll	Average number of on roll
	Percentage Attendance	Percentage Attendance	Percentage Attendance
1958			
October			
November	427,000	108,000	535,000
December	92.3	93.1	92.5

The figures for the various types of school were as follows:

	Average number on roll	Percentage of attendance
Grammar	117,000	95.2
Technical	27,000	94.6
Comprehensive	6,000	92.6
Multilateral	1,000	92.2
Bilateral	14,000	92.8
Modern	368,000	91.4

More detailed information was supplied in connexion with 275,000 of the secondary modern pupils. Statistics were provided

which indicated the percentage of attendance in each academic grouping of the children.

<i>Academic group</i>	<i>Average number on roll</i>	<i>Percentage of attendance</i>	<i>Maximum and minimum percentage contained in the figure shown in preceding column</i>
A	94,363	93.3	96.9—88.2
B	88,550	91.2	96.9—86.0
C	59,909	90.4	96.3—84.6
D	23,871	89.9	96.9—84.5
E	7,015	90.3	96.3—82.4
F	2,403	89.7	98.0—78.8
G	396	89.4	94.4—85.9
H	456	91.2	97.0—86.1

The differences between the maximum and minimum group figures were twice as great in the county boroughs as in the counties.

What is a reasonable percentage of attendance at school? Figures are not available to supply an authoritative answer but it is the consensus of opinion of officers with many years of experience of school attendance work that over the past few years it would be reasonable to assume that secondary schools attain 91% average annual attendance. There is, therefore, a balance of 9% to be accounted for. At various times checks have been made and usually it has been found that about 5% of school children are absent from school on account of ill health which has necessitated medical care.

If these two figures are accepted one is left with 4% of absence to be explained. It would probably be generous to say that half of this 4% may be due to causes which could be designated "unavoidable". The residue, 2% of the number on roll, is absent from school for reasons which the local authority may reasonably describe as "unacceptable". 2% of the school roll is not a high proportion, but if an area is taken in which there are 25,000 children on roll at secondary schools it will be seen that at any one session there are 500 children absent who should be in attendance at school. This same measure applied to the national figure produces a result which is certainly most disturbing.

The difference between average attendance at grammar and modern schools is 3.8%, and may not appear to be unreasonable. However, if the matter is examined from another angle there

appears to be cause for concern. At any one session in grammar schools, out of every 1000 pupils on roll, 48 are absent; the figure for modern schools is 86, the absentee rate being almost twice as great.

Why should there be this difference? Pupils on roll at junior schools attend with consistent regularity: in the area of one authority the average percentage of attendance for a period of three years was 92.5%, compared with the 90.1% of the secondary modern schools. Usually the attendance of junior pupils is consistent throughout the age and academic groups. Is it reasonable to assume that as soon as they pass from the primary to secondary school group certain children should be stricken by ill health to the extent reflected by the figures? There are probably two prime causes for this sorry state of affairs: (i) lack of enthusiasm for education by the parent, (ii) waning interest of the children.

What can be done to bring about an improvement? The Education Welfare Officer must continue his efforts to stimulate the parents' interest in the education of the child. To do this work effectively he must be backed by an enthusiastic Authority and an experienced administration. He is the link between the child, the school, the parent and the Education Committee. Of all the local authority officers he is the one most likely to convince the parent of the value of education. Among social workers he is in a unique position. He is moving about his district at all times during the year and is usually accepted by the parents and children as counsellor and friend. It is largely due to his persuasiveness that so few parents are summoned to appear before the magistrates. During a recent year in the area of one Authority proceedings arising from the irregular attendance of children at school were instituted in respect of only one-fifth of 1% of the school population. It is significant, however, that 42% of the total number of cases related to children in their final school year. In this particular year group two-thirds of the summonses concerned girls.

The inquiry in connexion with delinquency in association with irregular attendance at school was limited by the fact that few Authorities have access to complete records. However, twelve county boroughs were able to supply information with regard to the number of cases, academic grouping and assessment of regularity of attendance at school. The total secondary school roll of the twelve authorities was 174,000. The results set out below will, it is hoped, stimulate interest and suggest lines for further investigation.

Educational category of delinquents

	A	B	C	D
	10%	31%	49%	10%
	<i>Attendance of delinquents</i>			
<i>A</i>		<i>B</i>	<i>C</i>	<i>D</i>
<i>Good</i>	<i>Poor</i>	<i>Good</i>	<i>Poor</i>	<i>Good</i>
77.6	22.4	79.3	20.7	77.3
				22.7
				76.5
				23.5

From this table it would appear that more than 75% of delinquent children appearing before the court have satisfactory school attendance records and that this percentage is constant at all academic levels. The figures are in respect of a limited group and it would probably not be wise to draw firm conclusions. A more complete review would, no doubt, produce a different result. Correspondents from various parts of the country referred to percentages of poor school attendance by delinquent children varying from 5% to 75%.

The schools have a most important part to play in the solution of this problem. More strenuous efforts must be made to encourage and assist those children less academically endowed. When examining the returns submitted by authorities it was found that certain groups of children designated "F" to "H" had very good attendance records. Further inquiries elicited the information that in one county borough in Lancashire some 28 boys had been drawn from five secondary modern schools and with the parents' agreement had been placed in remedial classes in one central school. All the boys were retarded, some to a very marked degree. They were, however, taken into the school family and made to feel that they were indeed contributing to the life of the school. It was possible to teach them in very small classes and the staff were particularly sympathetic. The boys have made excellent progress and some have elected to remain at school for a further year. The percentage of attendance of this group was equal to the average for the school.

As and when improved staffing ratios become possible it may be that a greater measure of help will be made available to the less able pupils in the areas of all authorities. Similarly, when additional facilities are being allocated it is to be hoped that these children may be allotted rather more than what, in the past, has been considered their fair share.

SETS IN SCHOOL ORGANISATION

by F. SANDON

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I. THE MINISTRY'S REPORT ABOUT "SETS"

ONE of the features of a recent Report of the Ministry of Education (1) is the emphasis on a "set" organisation for the teaching of mathematics. It is the object of this note to examine this recommendation.

The argument of the Report is as follows:

(a) In most schools, classes are formed by grouping together pupils of comparable general ability (p. 108).

(b) A block of forms can be regrouped into sets, possibly more sets than forms (p. 24). (It is pointed out that in "public", that is, independent, schools, a block does not necessarily consist of forms all of one year.)

(c) *Pupils of similar mathematical ability can thus be grouped together (p. 108).*

(d) The grouping will be based as much on attainments as on aptitude (p. 130).

(e) Grouping into sets allows of greater flexibility (p. 101).

(f) Such an arrangement allows pupils to follow suitably differentiated syllabuses (p. 108).

It is not clear why the argument is not applicable to any other subject of the curriculum. In other words, it is not clear why there are "form" subjects at all. It will be remembered that Dr J. B. Conant of Harvard recently suggested that "students should be grouped according to ability, subject by subject, in all courses" (2). There appear to be no reasons given in support of these ideas other than mere general impressions.

2. ORGANISING THE WORK OF A SCHOOL

Let us consider the problem as it faces the administrator of a school. He is furnished with an equipped building, a staff, some pupils, and his professional ideals and principles, to govern his choice of the education that he will give. One of his principles is that

at any particular stage his pupils will differ in ability and that it is commonly accepted by English educationists that it is an economy and an advantage to stream them, that is, to teach them in groups as homogeneous as possible. He will thus draft out a timetable (3) with this in mind, using as his elements classes of "parallel" forms (or sets) and syllabuses to give a progressive course that each individual concerned can follow over several years. How far can forms be identified with sets? How far can any one individual pupil follow a fast or a slow pack in any one subject throughout his school life? The organiser will remember all the time that the bright pupil in a slow pack cannot find his place if transferred into a fast pack of those of his fellow pupils who have had the same length of school life but who have been ahead of him in the years already passed.

3. SOME CORRELATIONS

There is, of course, a traditional way of dealing with these matters, though there appears to be very little that has been published that will actually justify in a convincing manner many of the practices. The whole problem appears suitable for treatment by some of the methods of operational research. The most serviceable of these methods for dealing with these particular problems is that depending on the calculation of some correlations. Our administrator will look in vain in the "obvious" sources for some statistics. From our own experience, of the "obvious" journals, the "educational" one will say that such results are too statistical for its readers and the "statistical" one will say that such results are too much a matter of educational administration. The writer has therefore drawn on data accumulated in his experience of some forty years in grammar schools of various types and, thinking that this may represent a fair sample of well-organised schools, presents the following table as probably and approximately representing the position in any form of an ordinary English grammar school.

<i>Average</i>		<i>Subject</i>		
<i>Correlation</i>	<i>"Overall"</i>	<i>Maths.</i>	<i>English</i>	<i>French</i>
Term-by-Term	.85	.72	.71	.78
With "overall"	1.00	.62	.62	.80

In these the measures used have been marks given term by term in the various subjects, based on classwork, homework, tests and examinations. The "overall" mark is a measure of the average general academic ability. It is derived from marks on all the subjects of the

curriculum, that is, those, using the language of the old School Certificate, of Groups I, II, III and IV. In the schools from which the figures are taken the three subjects specified (Mathematics, English and French) together contribute in equal shares to about one-third of the total. All the correlations, therefore, include a small amount of self-correlation. In all, there have been 63 correlations used. They have been averaged (using the Fisher z transformation and the E.S. Pearson Table (4)) from a number of values in each case. Each value has necessarily been obtained over one form only, whereas our administrator, faced with the problem of organising all his pupils, or, at least, all in any age group, will have more than the numbers of our one form to deal with. In consequence, the figures given probably underestimate the true correlations in some degree, as no correction for homogeneity has been applied. But it is unlikely that the values over wider grammar school groups would differ very much from ours, nearly all of which were from coeducational schools.

It may be noticed further that the correlations given in the table are not based on any experience in girls' schools (except some of those used in compiling the term-by-term correlation in mathematics) and it is thus possible that the figures might differ in such schools from these general values owing to the differing weights that some such schools might give the various subjects. It will be remembered that the Report points out that a "set" organisation is not much used in girls' schools.

4. USING THE CORRELATIONS

The first matter that our administrator will now have to decide is whether he can, when streaming, that is, arranging his pupils in what are now approximately homogeneous groups, know that the brightest of such forms will remain sufficiently constant in composition to enable it to go faster than the other "parallel" forms (that is, forms of the same age cohort) throughout the school course. The answer to this is given by the term-by-term correlation of the "overall" mark. This is .85. On the whole the pupils of any group when marked in all their subjects this term will correlate by this figure with their marks in the former term. If there are two parallel forms then, using the Karl Pearson Tables (5), we can conclude that five out of every six pupils of this year (or term) will qualify to work in the same group next year (or term). If there are three parallel forms, then no pupil of the fastest form should, next year, be properly placed in the slowest form. All this means that no pupil will be hopelessly mis-

placed if his form work at a pace suitable for the average member of it.

5. DECISION ABOUT SETS

Having decided the composition of his forms, the organiser has next to see if the pupils should be regrouped for any purpose. If he is in charge of a coeducational (mixed) school, he will have to group the children by sex for such subjects as P.E., games and handicraft, and, if he has a school with alternative courses, such as, for example, Latin or German, he will have to regroup these. In both these cases, the regrouped pupils must work at the alternatives at the same time. This rule is general: if he has any "set" classification, then all the sets of any block of forms will at certain periods be working simultaneously at the set subject, and the non-set subjects will, for all that block of forms, have to be taken in a reduced number of available periods. Our organiser will not, therefore, want to reshuffle in more subjects than he can possibly help. He will thus, in practice, be limited to considering if such a regrouping is necessary in the case only of those subjects that occupy a relatively large number of periods per week in the timetable of any pupil. A subject, such as, say, Scripture or possibly Art or Music, where there are only one or two periods per week and possibly only one specialist teacher, cannot be dealt with in sets. In practice, therefore, we are limited to consider the subjects that get, say, one period per day on the average or, say, Mathematics, English and French. Is it necessary in any of these cases?

6. RESHUFFLING FORMS INTO SETS

Let us look at the correlations for these three subjects with the "overall" mark. We note that for both Mathematics and for English the correlation is of the order of .6. This is relatively small and suggests that "sets" may be justified in these cases. If there are two parallel forms, there will be about one in every three pupils who would be misplaced for either of these subjects if he worked with his form for them: if there are three parallel forms, then about one in every ten of the top form and one in every ten of the bottom form might be interchanged for lessons in either of these subjects.

But before our organiser decides to organise his forms and sets, so that for, say, Mathematics, there is a set that will work with greater speed, will work more widely and go more deeply, we need to be sure that, as pointed out above, the composition of the group will be fairly constant. It is no good putting Smith with the fast pack for

this term if next term he might appropriately be in another pack. And the case of Brown is even worse if he is now in the slow pack and shows signs that he could go faster next term in the brighter pack. For it will be very awkward, and probably impossible, for him to catch up the work already done by the rest of that fast pack. We need, in other words, to know what are the correlations term-by-term of the marks in the proposed set subjects. These are also given in our table. They are of order .7. Thus, if there are two sets, about one in every four pupils ought to go from the faster to the other next term: if there are three sets, then one in every thirteen pupils ought to go from the bottom set to the top set. It may be of interest to find out if in Mathematics, for example, the pupil is suitably grouped by using "an occasional carefully compiled short test across all the sets in one block" (Report p. 130) but it will be of little practical use to our organiser.

7. CONCLUSIONS

Our organiser will, therefore, think very seriously before he accepts the recommendations of the Report about sets for mathematics, even if it is a subject that will perhaps lend itself more readily than do others to differences of approach and difficulty for pupils of differing capacity. He will probably prefer to see how far the above figures are really a fair sample and see what are the correlations for his own school before he decides to complicate his timetable by the added difficulties of reshuffling his well organised parallel forms into sets, whether for mathematics or for any other subject. It should here be pointed out that in comprehensive schools and similar institutions, where the pupils cover a very wide range of ability, the correlations that he finds will probably be greater than those of our table. The top line figures, being larger, will suggest that the difficulty that we have just spoken of will be less, but on the other hand, the larger correlations with the "overall" mark will imply that there is less need for any "setting" system.

In general, different groupings of pupils for two subjects will only be desirable, even if all the other conditions are favourable, if (a) there is a small correlation between the two subjects (so that the ranks of the pupils in the two subjects differ widely), and (b) if each subject has a large term-by-term correlation (so that the pupils' relative abilities remain fairly constant with time). We have therefore the rule: a "set" organisation is desirable and practicable only if the abilities in the subject are highly specific and these abilities are

constant and can be very reliably assessed: ordinary careful streaming is preferable in other cases.

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RELIGIOUS EDUCATION IN BIRMINGHAM BOARD SCHOOLS

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THE religious controversies, which so delayed the coming of the first Elementary Education Act in this country, are perhaps better known generally than the local struggles which continued after 1870. Although the Birmingham School Board was controlled during most of its life by Liberals, there was still conflict. It might be supposed that the dominance of the Board by a body so closely associated in 1870 with the National Education League (1), would necessarily have minimised the provision of religious education for pupils in the Board schools. But how far is this true? What were the main local developments and attitudes in this field? Are the issues involved viewed differently today? The present paper seeks answers to these questions.

At the first School Board elections in Birmingham in November, 1870 the majority of votes went to the Liberal candidates, but their distribution was such that the Anglican representatives gained a working majority on the Board. This majority enabled the introduction of a system of religious instruction and worship in the Board schools similar to that adopted by the London School Board. The Bible was to be read by the teachers and *taught*, and periods of worship arranged which would include the singing of hymns and the offering of prayers (2).

The Education Act allowed parents to withdraw their children on conscientious grounds from religious instruction and worship in elementary schools. It forbade any kind of denominational indoctrination in Board schools, but still the Liberal members of the Board were not satisfied. Three of them were ministers and two leading members of nonconformist churches, and all were very much concerned with filling their Sunday schools and churches. They feared, however, that children whose parents were not Christians might, wrongly, be subjected to Christian indoctrination in Board schools. Further, they claimed, no teacher could *teach* the Bible without

denominational bias. They strenuously opposed the measure introduced by their Anglican colleagues, and repealed it when the Liberals had gained a majority on the Board by the elections of 1873 (3).

The Church party made attempts to return to Bible teaching in 1877 and again in 1885. On the latter occasion the mayor of Birmingham was trying to avoid a School Board contest just before a Parliamentary election. He called the School Board candidates to meet in an attempt to reduce their number to the fifteen required on the Board. Nine were Liberals and seven nominated by the Clerical and Lay Council. At this meeting the Church candidates agreed to accept only five seats on condition that the scheme for religious instruction and worship of the London School Board was adopted for Birmingham. This scheme included reading from the Bible *with explanations and instruction* in "the principles of Morality and Religion", as well as the offering of prayer and the singing of hymns.

This proposal was rejected by the Liberals. The Church party then proposed a compromise by which they would withdraw one or two of their candidates on the following conditions:

- (i) That the Lord's Prayer should be used daily in all the schools and should be repeated by the children.
- (ii) That selected passages of the Scriptures should be read daily in the school classes by the children, with historical, geographical and grammatical explanations by the teachers.

The mandate of the Liberal candidates was still for "Bible reading without note or comment", but they agreed that one candidate should be withdrawn from each side and that the compromise be put to a meeting of their General Council (the "Two Thousand").

The compromise proposal may seem to us unexceptionable. Present day agreed syllabuses go considerably further in the matter of Christian doctrine. Some Liberals did support the proposal, but it was rejected at the promised meeting by a great majority, estimated at about ten to one (4). The Church party had held that the proposed instruction and prayers were not religious instruction, but merely prepared the way for the denominations to give it, a preparation especially important for children not already in touch with the churches. Religious instruction they defined as "touching the hearts of the children".

Dr R. W. Dale led the Liberal attack on this argument, both in a pamphlet (5) and at the meeting of the "Two Thousand". He claimed that explanations of the Bible, particularly of the meanings of words and phrases, were bound to involve doctrinal interpretations, which

would be those of the denomination to which the teacher belonged, and might be offensive to the parents of the pupils. If teachers were to be required to give such explanations, he said, they must be qualified to do so, and this would involve a religious test of teachers, which could not be tolerated.

It is true that parents had the right to withdraw their children from religious instruction. Nevertheless, the Liberals had a strong objection to any arrangement which might allow the merest hint of denominational teaching "on the rates". The Education Act of 1944 has removed the possibility of a religious test of teachers, since a conscience clause is included for them. The only exceptions to this are the *reserved* teachers in voluntary schools. Further, the omission of the time table clause has removed the necessity for all classes in a school to have religious instruction at the same time. These two changes have enabled the emergence of the specialist teacher of religion, or of small groups of concerned teachers responsible for religious teaching throughout the school. This makes for more effective teaching, though the problems of the training of these specialists and semi-specialists are by no means solved (6)

The agreed syllabus, as a basis of religious education in maintained schools to-day, is perhaps as much an expression of the determination of the denominations to co-operate as it is a vehicle for ensuring undenominational religious teaching. In this we have gone far since 1885. The latitude permitted in using the syllabuses would surely have appalled the "Two Thousand". Much reliance is placed on the integrity of the teacher. It is generally recognised that teachers must be sincere in the expression of their own beliefs, if these are asked for, but that they should try to give as fair a conspectus as possible of the various views on controversial matters. The small group of teachers working together in a school can be a guard against biased teaching, if the teaching syllabus is worked out by the group and there are frequent consultations over difficulties as they arise. We leave the ultimate responsibility for the just interpretation of the agreed syllabus, however, with the individual teacher. In this we differ from Dr Dale and his colleagues.

At the School Board elections of 1888 the Birmingham Liberals maintained their stand for Bible reading without note or comment, though one of their candidates, George Dixon M.P., did not entirely agree with his colleagues on the religious issue. All nine Liberal candidates were returned. Only three representatives of the Clerical and Lay Council were elected. Dr Gardiner disagreed with his

fellow Churchmen and stood as an Independent. He was elected at the head of the poll, whereas Mr Greening, who had been one of the main opponents of Dr Dale during the controversy three years earlier, failed to regain his seat on the Board. This result was a strong indication of the local support for the view of the Liberals on religious instruction.

Although so adamant in limiting the religious teaching that might be given in their schools by Board teachers, the Liberals welcomed the entry of the denominations into the Board schools when they were not officially in session, to give religious education and conduct services for their pupils. Under regulations adopted by the Board in 1873, on two days a week rooms in their schools could be hired by voluntary bodies. On these days the schools were to open officially three quarters of an hour later than usual in the morning, to allow religious teaching to be given to any of the pupils whose parents wished it.

The Birmingham Religious Education Society was formed to give this teaching. Its chairman was Dr Dale, himself a member of the School Board. The general doctrinal approach of the Society was that of the evangelical churches. Until 1878 the Society prepared its own lesson notes, but in that year those of the Sunday School Union were adopted. Its teachers belonged to some eight denominations, though most of them were Independents or Baptists. At the start, in 1873, they numbered 80, but by the third and fourth year of the Society there were twice that number, of whom about two thirds were women (7). In order to increase the number of schools visited, the Society abandoned their original plan of two visits a week to each. Eleven out of the twenty Board schools in 1877 were visited once a week, and the number attending the classes was well over one third of the total number of children on the School Board registers (8).

A few Anglicans gave religious instruction in Board schools under these regulations, but in general the clergy did not use this opportunity to enter the schools. Indeed, in January, 1877 the Church party on the Board introduced a motion to abandon the regulations and to return to their own plan of instruction by the Board teachers, operated before 1873. They claimed that the voluntary agencies had failed, as they were reaching only one third of the children in the schools. Commenting on this argument, *The Times* pointed out that it was largely due to the lack of Anglican effort that the number receiving religious instruction was not larger (9). The motion was defeated and the Religious Education Society continued its work.

Later, in 1878, the Church arranged for instruction in the Bible and Prayer Book to be given at four centres for two hours each Saturday morning to Board scholars who had passed the third standard.

Nevertheless, to avoid a School Board contest in 1879, agreement was reached between the parties that religious teaching in the Board schools should consist of reading the Bible by the ordinary teachers without note or comment. Francis Adams remarks, "The religious communities were forced to admit their inability or their disinclination to teach religion without state assistance" (10). Perhaps he wrote too soon to get a perspective view. At all events, it was not long before the denominations were again allowed entry to the Board schools for religious instruction on two mornings a week. Certainly, withdrawal classes under the Education Act of 1944 have not claimed as many as one third of the pupils of maintained schools, but this may perhaps be ascribed partly to decreased interest of parents and partly to greater interdenominational toleration and ready acceptance of an agreed syllabus. Sound agreed schemes of Biblical instruction have to-day led the churches to use withdrawal classes largely for practice and instruction in worship. The Established Church is much involved in this work, and reports close co-operation between the denominations in some areas (11).

It is interesting to find closer interdenominational co-operation in Birmingham in providing religious services in Board schools than there had been, at any rate between the Established and the non-conformist churches, over religious instruction. In March 1889 an enquiry amongst staff and pupils of the schools showed that a weekly short service would be welcomed. The School Board was approached and permission obtained for a few school rooms to be hired for the purpose. Attendance was, of course, voluntary, and a circular explaining this was sent to all parents of children in the schools concerned. The result was, in fact, a higher attendance on the mornings of the service than on other mornings. After three months the Board agreed that all its schools should be served in this way. Board school teachers volunteered to help, and in some cases large numbers necessitated more than one service in a school. Succeeding School Boards continued to allow services to be conducted in their schools by voluntary bodies.

The organisation providing the services was not clearly defined. There appears to have been no official committee, except for the purpose of selecting hymns suitable for the children and having them printed (12). Regular meetings, however, were held by the

helpers, for prayer and consultation. It is clear that it was an inter-denominational body in which the Established Church was well represented.

This movement also concerned itself with the problem of Board scholars not in contact with any church. The School Board agreed to give a list of the names and addresses of 12,700 of their pupils believed not to be attending a Sunday school. The Birmingham Sunday School Union then undertook a canvass, which showed that about one third of these children were in fact attending. The canvassers persuaded the parents of a further 2,000 to send them to Sunday school.

In conclusion, it appears that religious education was by no means absent from Birmingham Board schools. It is perhaps significant that two such outstanding efforts of the denominations as those initiated in 1873 and in 1889 should have been concerned with the contact of the churches with Board scholars, either by the entry of the churches into the schools, or by putting children in touch with the churches. Lack of such contact appears to the present writer to call for serious concern today (13). Religious education and worship are conducted in our maintained schools with increasing success. There is a danger, however, that school religion may become a thing apart from the Christian communities outside, to be left behind on leaving school. This can only be avoided if the churches combine to ensure more effective contact with the pupils. Some such contact does seem to have been made in the Birmingham Board schools.

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“ON ‘THE PUPIL’S THINKING’”*

A Review Article

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PROFESSOR PEEL is one of those who firmly believe that it is part of the business of psychology to provide the teacher with a secure scientific foundation upon which to base his educational practice. In the course of his earlier work, *The Psychological Basis of Education*, he described the theories of learning most favoured by psychologists and showed how these might account for various aspects of the classroom situation. The present volume is more limited in its scope, since it is concerned only with the scientific study of the development of the child’s ability to think, together with the practical implications of this study. Nevertheless, it is if anything more important, because it is probably the only work of its kind to tackle the question of what we should teach and how we should teach it, at any rate from a psychological point of view.

Much of the book is more or less directly based on the theoretical and experimental work of Piaget and Inhelder. Nevertheless, the writer can claim with a good deal of justification that it is very much more than a bowdlerised summary of Piaget’s views. Its orientation is frankly educational and practical, where Piaget himself is more particularly concerned with the general theoretical question of how children attain to the idea of logical and mathematical necessity if these are not inborn. Moreover, Peel draws on a number of sources to expound his ideas, including the work of Skinner on verbal behaviour, of Gestalt psychology on problem solution, and above all on recent experimental work carried out in Birmingham, designed to bring out the relevance of the pupil’s thinking to the educational syllabus.

In the first chapter, the author provides a general outline of the scope of the problem. He suggests a fourfold classification of thinking, having regard more to its contents than to its essential psychological basis. The four types of thinking which he suggests in order to bring out the applicability of theoretical discussion to the actual thinking involved in school work are:

- (1) Thematic thinking, as shown e.g. in creative writing;
- (2) Explanatory thinking, as shown e.g. in the solution of geometrical problems;

* E. A. PEEL, *The Pupil’s Thinking* (Oldbourne Press, London, 1960, 15s.).

- (3) Productive thinking, as shown in the solution of practical problems; and
- (4) Integrative thinking, as appears in the theoretical constructs of major figures in science.

The last three are variants of a single process: directed thinking bearing on the necessities apparent in the interrelations of objective facts; the first draws more heavily on subjective and emotional associations such as those which appear in dreams, while at the same time imposing on these a structure of its own, analogous in certain respects to the logic of directed thinking. Nevertheless, Peel's classification is very useful to his expository purpose.

The second chapter, which is short, deals with the development of thinking from its first beginnings to the age of school entry. The reader will find a clear and concise exposition of a number of ideas bearing on the limitations of the younger child's perspective. The theoretically-minded student should perhaps ask himself how far it is possible to unite the biological approach of Piaget and the behaviourist account of Skinner within a coherent conceptual framework.

By far the most important part of the book are the central chapters which deal with the thinking of school-age children. The last of these (chapter VI) is concerned with the contribution of Wertheimer and Duncker in stressing the value of a "structured" presentation of material to achieve a greater measure of understanding on the part of the pupil. The remaining four chapters draw more particularly on the ideas of Piaget. This is because the writer believes that the facts which they have brought to light, and the interpretations which they put forward, are of fundamental importance to the teacher. The latter is doing two things. First, he is trying to communicate a body of knowledge and skills in the most effective way. Second, he is trying to encourage his pupils to think for themselves. In so far as this second objective can be divorced from the first, Peel finds a number of important things to say in the concluding pages of the book, where he urges that some attention be given to the direct teaching of logic in secondary schools, particularly in the senior forms. But the author is well aware that such an objective can also be realised incidentally, if due attention is paid to the psychological implications of the first, i.e. of what constitutes good teaching.

In order to communicate effectively, the teacher needs to know how what he is saying or demonstrating will be understood by his pupils. In so far as the content of the teaching is not limited to isolated connexions (as in rote-memorisation of tables or spellings), but extends to the relations between physical and mathematical facts, or historical events, and so on, the pupil is required to think. In other words, he must structure these relations for himself. If he is unable to do so, and the teacher simply provides him with a ready-made formula which sets out the structure, the pupil can still be taught to memorise the formula. But this kind of

learning is merely verbal. The pupil knows the formula, but he cannot explain it, he does not know when to apply it, and he cannot modify it where necessary. The reader will find many instances of this kind of thing in chapters III, V, and VII of this book. An example which will be familiar to all teachers is the child who is fairly successful in mechanical arithmetic, but seems unable to tackle even the simplest problems.

Piaget has shown how certain ways of structuring ideas are acquired about the age of 6-9, and are therefore characteristic of the thinking of the primary school pupil. Children of these ages are able to tackle problems involving relations between concrete objects, and simple representations of concrete objects. They can classify these in terms of their similarities and differences and they are also able to cross-classify them on the basis of overlapping characteristics. Thus they are well able to arrange a set of beads so as to take account both of differences in colour (red or blue) and of differences in shape (round or square). Similarly, they can order a set of objects in terms of one or more dimensions. Peel gives the example of motor-cars which can be ordered on the basis of horse-power. They can also be ordered on the basis of the wealth of their owners. The primary school pupil can not only perform both orderings or *seriations*; he can also establish the correspondence between the one kind of order and the other.

But there are also limitations to the thinking of the primary school pupil. Although he can "read off" the relations between concrete terms (similarities and differences linking a group of objects or events), he cannot go beyond the evidence and formulate general laws in order to *explain* and *interpret* the relations which he finds. These limitations are admirably illustrated in the attempts made by children of various ages to break down a code. The task, devised by Professor Peel, and described on pp. 101ff, is entirely in the spirit of Inhelder's experiments on "The Growth of Logical Thinking". The code itself is somewhat more difficult than the familiar problems of the Terman-Merrill Intelligence Test. Each letter is represented by two letters in the code. The first of these may be discovered by establishing a letter for letter correspondence based on their alphabetical order. The second cannot be resolved by a simple letter for letter correspondence. In order to show that he has resolved the code, the subject must be able to encode words which include letters not figuring in the examples. These consist of a series of words with their corresponding coded spellings. The primary school child succeeds only in so far as he can establish a direct correspondence between letters figuring in the examples and those he is required to encode. In other words, he may be partially successful with the first component of the code, but he fails altogether in solving the second. The older child or adolescent is not content to establish correspondence. He seeks to discover the general rule. He tries a number of hypotheses in turn to see if they will work.

The ability to look beyond the evidence, to formulate hypotheses, and to test their implications against the facts constitutes the most general characteristic of adolescent thinking. Here the results obtained by Peel in his coding test are parallel to those obtained by Inhelder in the course of the many ingenious experiments which she devised in order to study the development of reasoning in relation to problems of science. But what is new and stimulating in Peel's work is that he has been able to bring out the generality of this development, by showing how it is manifested in a wide variety of different scholastic activities. Thus in chapter V, he shows how the same development underlies the different kind of understanding which appears in the adolescent's interpretation of a historical passage, when compared with the sort of understanding which may be expected from the primary school pupil. In chapter I, the reader may find the same trend reflected in an essay by a sixth former on a literary topic. Finally, on p. 109, Peel provides an instructive example of how the teaching of language is frequently misdirected, precisely because the kind of explanation given by the teacher to children of 11-13 is such as to imply this sort of reasoning.

The implications of this analysis will be abundantly clear. In the first place, as Professor Peel correctly points out, pupils at every stage, and particularly at the primary stage, need to be given a sufficient background of concrete experience in which they themselves can observe the relations with which they are to be familiarised. There are two errors to be avoided. The first consists in trying to put over a conceptual framework which is beyond the pupil's capacity; for instance one which involves propositional reasoning or hypothesis testing, where the pupils have not reached beyond the concrete level of reasoning. The second consists in not making adequate use of the thinking powers at the pupil's disposal, as in the "mechanical" presentation of rules. However, since the first course cannot achieve its avowed object, it must itself result in the same kind of blind adherence to "verbal" rules as the second. There is every reason to suppose that these two kinds of error are responsible for a good deal of backwardness in school, particularly in mathematics, as shown in the work of Saad (referred to in chapter III). It goes without saying that children who have been so taught are inclined to develop negative attitudes towards the subject, and that these, combined with the fixation of habit at a primitive and "irreversible" level of response, do much to prevent them from using their powers of thinking in that subject, when this should be possible as a result of their increased maturity.

An admirable feature of this work is the clear and concise presentation of the basic logical structures of thought in chapters IV and VI. However, although this may seem a minor point of difference, I find it difficult to agree with Peel's suggestion that these should be looked on as "models". A model is essentially a simplified presentation of a process designed to highlight what is essential to it, which may be obscured by the com-

plexities in which the process normally occurs. But the model is itself an *instance* of the process and not merely a statement of its form. In this sense, the behaviourist's explanation of learning is a model, since it is suggested that other more complex learning situations are reducible in principle to, say, the kind of behaviour shown by a rat learning to run a maze. Piaget uses a logical notation in order to describe the structures *actually found to exist* in children's thinking, whether or not the latter would be capable of abstracting them and describing them in the same terms. The logical description is an abstraction since it is essentially a form stripped of its content. I believe it would be more correct to regard each of Inhelder's experimental situations (an Peel's example of the code) as separate models, often involving *different applications* of a *common logical structure*. The thinking actually encountered in the classroom can then be referred to as analogous to one or other of these models.

It is an essential part of Piaget's theory that there can be no single piece of behaviour which could serve as a model for all thinking or learning—least of all the sort of behaviour within the scope of a rat. The number of possible *structures* (we might think of them as general ways of organising behaviour and thought) is strictly limited. But they can only develop in a fixed order, since the more complex structures make use of those which are simpler. The number of possible *models* (each of which would represent separate modes of behaviour involving these structures) would also be finite, although considerably greater.

The various "theories of learning" have this in common that each of them attempts to reduce all behaviour to what is instanced in a single model. As a result, whatever is specific to more highly developed forms of behaviour tends to be dismissed as devoid of "scientific" interest. An incidental corollary is that such theories are compelled to overlook much of the specificity of the behaviour chosen as a model. (Trial-and-error, the equivalence of the objective situation and the stimulus, and external as opposed to intrinsic motivation—to name but the most common.) It is for this reason that so little of what they have to say has any practical relevance for the teacher. And it is for the complementary reason that Piaget's position is full of possibilities for educational progress, as the whole of Peel's work so amply testifies. One might add that the attempts of certain psychologists to "account for" Piaget's work in terms of behaviourist theory (I certainly do *not* include Professor Peel in their number) might be compared to the attempts of flat-earth men to account for the revolutions of sputniks in terms of what appeared to them to be the only sound "scientific" method of describing the universe.

The last chapter but one is largely devoted to a consideration of the relevance of Gestalt theories for classroom practice. In the excellent glossary provided at the end of the book, Peel offers two separate definitions of "structure". One of these refers to Piaget's usage of the term. The other, quite different definition refers to its usage by Duncker: "The

relatedness of the parts of a perceptual or conceptual experience which gives it its characteristic quality.' Piaget uses the term "structure" in referring to a general mode of organising behaviour and thinking in a given situation. The same term in Gestalt psychology is used on the one hand, to refer to the essential relations featuring in the situation itself, and on the other, to the relations as reflected more or less adequately at various moments in the thinking of the subject about the situation. The first usage harks back to the parallelism ("isomorphism") assumed to obtain between the objective character of a situation and its perceptual organisation. This usage, which stresses the meaningfulness ("Pragnanz") of the immediate perceptual situation, is contrary to Piaget's developmental approach. In the course of his genetic studies of perception, Piaget has shown that every one of the "good forms" of Gestalt psychology is the product of a more or less protracted development. What is a "good form" to the adult subject is not necessarily a "good form" for a child. The second usage describes the relations which the subject assumes at any moment to be manifested within a given content. Since the Piagetian use of the term refers to ways of organising the thinking of the subject, whatever the content, and moreover demonstrates the limitations of such organisation at various phases of development, it follows that the Piagetian structure is pre-supposed by (but not identical with) the structures of Gestalt psychologists. In fact, each re-structurisation in the typical Duncker situation represents an alternative "hypothesis", analogous to the hypotheses revealed in the thinking of Inhelder and Peel's adolescents. However, as Wertheimer has shown, the action of such structurisations is not limited to the level of formal "reasoning by hypotheses". At earlier levels, the structurisation may correspond e.g. to the *anticipatory schema* which envisages the possibility of classifying a group of objects in a particular way, while a re-structurisation would be implied by the schema which envisages an alternative basis of classification. (A set of beads can be arranged in two different ways: either on the basis of colour, red versus blue; or on the basis of shape, round versus square.)

Certain educational implications follow from the fact that the teacher (or the experimenter) can arrange the material situation in such a way as to encourage or facilitate the appearance of a particular anticipatory schema. *Depending on the level of development reached by the pupil*, the teacher can create a situation which facilitates what *he* knows to be the relevant instantiation of the structures available to the pupil (Piaget's sense) in a particular anticipatory schema (= "structure", *second* usage in Gestalt psychology). The relevance of the schema is known to the teacher because he himself has a grasp of the subject as a whole (which always and necessarily involves a formal structure of thought). Such, stripped of its metaphysical associations, is the truth concealed behind the *first* usage of the term "structure" by Gestalt psychology.

An excellent example of such facilitation is the "structural apparatus"

for the teaching of arithmetic (Sterne, Cuisenaire, Dienes). There is good evidence of its value, at any rate with backward pupils, in a recent study by Ives (1). Similarly, at the level of formal reasoning, each of Inhelder's experimental situations "structures" the situation in such a way as to facilitate the formation and testing of relevant hypotheses, relevant in terms of scientific theory.

The essential difference between Inhelder's adolescents and an Archimedes or a Galileo is that the latter were able to formulate these hypotheses without Inhelder's situational prompting. It is this which distinguishes the "integrative" thinking described by Peel from his "explanatory" or "productive" thinking. The structure of thinking is the same. But the first of these requires a far greater mobility in the search for content within which these structures can act, and hence, in all probability, a greater awareness of the structures themselves.

It follows that intelligence has at least two dimensions (it may have more) and not one. These are referred to by Dienes (2) as "analytic" and "synthetic" intelligence. The first of these, in the terms here being used, refers both to the gradual elaboration of concrete and formal structures as understood by Piaget, and to what might be called the powers of endurance of a schema; e.g. to the number of alternative hypotheses, their tests and their results, which the subject can bear in mind in the course of trying to solve a formal problem. The distinction between these two aspects of reasoning constitutes the essential difference between Piaget's approach to intelligence and that of Spearman. Dienes's "synthetic intelligence" refers to the kind of inventiveness and disciplined imaginative mobility which are exhibited in the highest degree in the search for appropriate analogies and hypotheses described by Peel's "integrative thinking". Dienes's thesis, that the same function must also be manifested in some form in less exalted spheres of thinking, has much to recommend it.

On the other hand, the possibility of an exact measurement of either "analytic" or "synthetic" intelligence (as opposed to the general ascertainment of levels and the determination of mental deficiency) may well be illusory. Both are abstractions which are manifested only in relation to a given content. The effectiveness of thinking must therefore vary from one content to another, depending on the interests and experience of the subject. This is well illustrated by Peel in his analysis of the effects of familiarity with the material on problem solution (pp. 275ff). But what is more, practice and satisfaction in using particular ways of thinking can probably influence the general tendency to adopt them. Here, too, we may well reflect over what Peel has to say on the promotion of thought (pp. 180ff). This explains why the general curve of intelligence growth tends to flatten out at 15, while the intelligence of university students goes on growing to the age of 22!

There is one final point. Peel gives a number of examples illustrating

how, by presenting the pupil with situations designed to facilitate the *discovery* of the essential relations involved, the teacher can foster the growth of a positive interest, together with the disciplined curiosity which marks an inquiring mind. Whether by repeatedly and continually creating the optimal conditions for the exercise of analytic intelligence we can stultify the tendencies to synthetic inventiveness must remain a question for further combined research by psychologists and teachers. It may be that there are more complexities in the educational situation than we have so far been able to penetrate.

Some of the foregoing could possibly be misconstrued as forming a criticism of Peel's work. This is certainly very far from my purpose. A scientific text is a bad text if it does not provoke discussion and raise further problems for theory and research. I suspect that Professor Peel would be largely in agreement with most of the foregoing, although there may still be differences of emphasis. *The Pupil's Thinking* is a small book. But its very conciseness is a tribute to the author's complete mastery of his subject. Because that subject is of fundamental importance to education, this book will for a very long time form an essential part of the theoretical equipment of the teacher-in-training and a source of inspiration to the experienced teacher as well as the college lecturer.

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ON FASHION IN EDUCATION AND PSYCHOLOGY

A Review Article

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A GLANCE at the title of Part II of the 59th Year book of the National Society for the Study of Education, *The Dynamics of Instructional Groups* (1), gives the impression that here we have a book which is already out-dated.

As any editor of an educational journal in this country is aware, the current fashion is to write on the teaching of mathematics and science or, when "numeracy" appears too far in the ascendant, on the need for a broader education. And there is every reason to believe that the experience of American editors is comparable. The West has become suddenly aware of its need to develop technical expertise; the more perceptive see also its need to promote the spiritual and cultural values which are its identity. Within a few years this has become the great educational issue of our time. Such is the trail of a sputnik! Discussions of freedom and responsibility now have a ring of the past. The heyday of "education for living", and of group dynamics, was a decade ago. Yet here is a book which dares to include the words "group" and "dynamics" in its title.

In the world of psychology as in the world of education, the study of group relationships has for some years been under a cloud, but for a different reason. Psychologists of the hard-headed variety have been much impressed by the achievements of the behaviourist Clark Hull (2). One after another they have predicted that although Hull's theoretical system might have to be modified almost out of recognition, yet future psychological theories would be of the same kind. In other words, psychological theories would take the classic scientific pattern in stating clearly their postulates, arguing deductively from these to obtain verifiable predictions and, following experimental verification or falsification of these predictions, elaborating the theory or correcting the postulates accordingly. All terms were to be defined operationally, all relations to be expressed quantitatively, and the system was to be self-correcting. Those branches of psychology which work with less precise definitions (including, be it admitted, group dynamics) fell into disrepute and became the refuge of the soft-headed.

Unfortunately it has become progressively more apparent that Hull's attempt to produce a comprehensive behaviourist theory was premature.

(A warning could perhaps have been taken from other efforts to elaborate an ambitious quantitative psychology—as that of Herbart in the last century, or Lewin in this). Watson's *Behaviourism*, despite the acclamation it received in some quarters in 1924, was found to be a programme rather than a theory. Hull's theory has similarly proved speculative, rather slow to yield verifiable predictions and far from self-correcting. The apparent consequence of this setback has been a limiting of their ambitions by the hard-headed.

What, we may ask, is our present inheritance from Hull? In the first place, there is a much greater interest in learning theory. The pioneer work of Burt on the factorial analysis of mental ability, and the work of Eysenck on the factorial analysis of personality traits, were essential to the establishment of an agreed system of classification. A complete psychology, however, requires also the aetiology which is given by learning theory. This has been recently supplied for educational psychology by Peel (3) and for personality theory by Eysenck (4). It is probably in this field that some of the more interesting developments in psychology will lie, possibly with new models of learning provided by the programs now being written to enable computers to solve logical problems, learn words and think "creatively". But whatever the source of future learning theory, it has now been demonstrated that we need not necessarily have recourse to innate factors as an explanation of children's abilities and personalities. It has been shown feasible to produce an outline of theory which would explain how these are learned. We are now free to speculate in terms either of innate ability or of learning, according to taste; or, more realistically, we are in a position to work with either kind of hypothesis and find out what we can. There is no longer one acceptable and all-embracing theory of behaviour; but there is a style of explanation which for everyday purposes can be used, in piecemeal fashion, always tentatively, and with an eye on possibly profitable research, to suggest how children learn to behave and think as they do.

Secondly, Hull's work has created a demand for greater rigour of thought in psychology, for a more exact definition of concepts, a more precise statement of postulates and predictions, and the setting of all problems in a hypothetico-deductive framework. Some of the effects are to be seen in Argyle's *The Scientific Study of Social Behaviour* (5), which attempts to deal with social psychology in a more exact and objective manner than is usual. In another field the effect may be seen in Wiseman's call for the eradication of any vague or "homespun" psychology from courses for the training of teachers (6).

But, as already indicated, it is ever more apparent that psychology is hardly yet ready for a Newton. Not only has Hull's theory failed to work as he hoped: there is appearing a general assent that this type of theory is as yet too ambitious, and there is a tacit agreement among many of the hard-headed that much nibbling at specific problems is required before another

grand theory is attempted. We may therefore hope for a third portion to our present inheritance from Hull, namely, a more general tolerance of other forms of psychological work. It may be claimed that the hypothetico-deductive framework is only one of the many forms used by scientists. Certainly it is a form not applicable to all work in psychology at the present time. Blyth (7) has recently suggested the advantages of a less precise framework of this kind. Elsewhere in this Journal is a review of a recent publication by Peel (8), part of a new and much-needed rigorous psychology of child development, but with a rationale quite different from that used by Hull.

If we are interpreting correctly the current of thought in this country, then perhaps the advent of the Yearbook on *The Dymanics of Instructional Groups* is, after all, timely. There is at present relatively little in either social psychology in general, or in the psychology of small groups in particular, that can be described precisely in behaviourist terms. But there is a wealth of experience in the handling of small groups that yields valuable generalisations. It is such generalisations which, based upon both experimental work and the established skills of teachers, clinicians and their colleagues, are likely to form the basis of a future science. And since it has such a basis, the Yearbook is both readable and relevant.

Further, we may note that it is concerned with *instructional groups*, and is centred upon "the pressing problems of instructional practice". Is it, perchance, determined in its detailed approach by the requirements of this new decade? This is, in fact, no longer the old group dynamics. Any interest in group processes as such is incidental: the concern is emphatically with the individual and how he learns. In this sense, the Yearbook once more draws attention to a plain truth which we too commonly fail to notice in the day-to-day business of education: human beings learn to think, and to be intelligent, within a social framework which becomes a very part of them; and it discusses some of the details whereby this occurs in the classroom.

Efficiency in learning and thinking is now one of our central interests, whether in the sciences, the arts or in practical life. In a competitive world, when we are investing more and more heavily in education, we cannot afford to have it otherwise. In pursuit of this interest, and whatever the basis of our psychology, we shall inevitably come to a study of learning and thinking in its social context. Moreover, if we are not to be determined by events and without free will, such study must have a central place in educational theory and practice. So-called "common sense" in education is, in fact, a hotch-potch of long accepted, outworn (and probably ill understood) principles and psychology. The choice is not, shall we have our teaching in school guided by definite principles and in accordance with a psychological theory, or shall we be "practical"? The choice is, in fact, shall we act as automata, or shall we *think* about our principles and psychology?

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BOOK NOTICES

YOUNG PEOPLE GROWING UP

R. STRANG, *The Adolescent Views Himself: A Psychology of Adolescence* (McGraw-Hill Book Co. Inc., New York, 1957, 49s.).

J. HEMMING, *Problems of Adolescent Girls* (Heinemann, London, 1960, 18s.).

K. M. EVANS, *Club Members Today* (National Association of Mixed Clubs and Girls' Clubs, London, 1960).

W. D. WALL, *Child of our Times. Cultural Change and the Challenge to Healthy Mental Growth* (National Children's Home, London, 1959, 7s. 6d.).

T. S. SIMEY, *The Concept of Love in Child Care* (National Children's Home, London, 1960, 7s. 6d.).

J. MACALISTER BREW, *Youth and Youth Groups* (Faber and Faber, London, 1957, 18s.).

R. HACKER, *Telling the Teenagers. A Guide to Parents, Teachers and Youth Leaders* (Andre Deutsch, London, 1957, 8s. 6d.).

SOME young persons are earnest seekers after knowledge. Some are eagerly devoted to physical improvement. Some concentrate upon the discovery of a mate. Some are listless and apathetic—professing no interests of any kind. Some are rebellious and destructive and some are prepared to co-operate in the training of others in clubs or schools. There is no one pattern of the teenager or even of that larger group—the adolescent.

Realisation of this has come slowly over the last 20 or 30 years partly as a sequel to the findings of long-term studies which follow the development of children over a number of years and partly as a result of carefully conducted cross-sectional researches into the views held by adolescents about themselves. It is not now possible for responsible observers to accept the theories popularised some 50 years ago by Stanley Hall and Sigmund Freud to the effect that storm and stress, rebellion, moodiness and the like are biologically and inevitably an accompaniment of the years of transition from childhood to adult life. What has now to be noted is that infinite variety is as characteristic of young people as of their parents and that adolescents are more like their elders than their elders were formerly encouraged to suppose. Illustrative of this are three recent reports.

Writing from Teachers College, Columbia University, Strang applies to the study of adolescent psychology the techniques relevant to the study of conscious thinking in conjunction with information from psychometric and sociometric researches into development towards maturity. Her emphasis is on the meaning of life as seen to-day by extensive samples of

adolescents and on their perception of the contribution they are called upon to make (their developmental tasks of achieving physical maturity and scholastic success, building desirable social relationships within their families and with others of the same and the opposite sex, and finding a vocation). This is supplemented by a concluding section on the steps that can be taken by adults to provide the conditions in which wholesome growth can be expected. Professor Strang's treatment of all these topics is scholarly and thorough, and extensive quotations from essays, interviews and questionnaires lend liveliness and reality to the picture. This is a book to read and re-read.

More limited in its range is Hemming's analysis of some three thousand letters sent by adolescent girls to a weekly periodical over a period of two years. Like much of the evidence in Strang's book the problems these describe are noteworthy not for any qualities peculiar to an age-group but for the reminder they give that young people like adults long for acceptance and for insight and that like their parents and teachers they are perpetually concerned with the detail of personal relationships at home and outside. What do other people think of me? Am I adequate to this? What is the meaning of it all? Am I doing what I should?

The sample is inevitably taken from those who are most interested to read about the difficulties of others and most willing to write about their own; but the picture it gives is of normality rather than of abnormality and of sturdy common sense rather than of an undue degree of neurotic self-pity. Its impact is lessened by the somewhat uncritical inclusion of earlier findings obtained from the recollections of students obviously under the influence of the old stereotypes as to the nature and the behaviour of adolescents. "Of course I was miserable." "Of course I didn't care." "Of course my parents didn't understand me." In the sections which are his own, Dr Hemming, however, writes with wisdom and conviction; and his book makes a moving plea for greater sympathy from adults both at home and in school.

Club Members Today by Evans is in some ways a companion picture obtained by responses to a questionnaire sponsored by the *Woman's Mirror* and answered by some 2000 members of clubs affiliated to the National Association of Mixed Clubs and Girls' Clubs. The writing of essays and letters is limited by the skill of the writer and by attitudes towards those who are expected to be their readers. Replying to questionnaires may also include a measure of self-concealment; but the answers analysed in this book bear testimony again to the common humanity of adolescents and to their active concern with the part they have to play in the world as they perceive it.

These direct studies of adolescents are usefully supplemented by the publication of two lectures from a series sponsored annually by the National Children's Home. In a discussion of cultural change and its challenge to healthy mental growth Wall gives a persuasive presentation

of the thesis that the personality of western man is changing in response to changes in his material and psychological environment. This is a dangerous generalisation sometimes used as a cover for indifference or despair; but Dr Wall is not unmindful of the selective character of perception and the variety of viewpoint in differing sub-groups and he points beyond cynical acceptance of the inaccessible strangeness of youth to the possibility of ministering through more constructive education to the human needs of appreciation and insight in the areas of vocation, social behaviour, sexual adjustment and interpretation of life. His book carries the reader beyond the technicalities of school or club to social movements in the world at large. It breathes hope rather than dismay and it is indicative also of the distance travelled by psychological interpretation since the theories of the biological psychologists were presented in the opening years of the twentieth century.

A similar challenge from a slightly different point of view is presented by Simey in the 1960 lecture. In this he traces the Christian contribution to child care and stresses the inadequacies of the psycho-analytic concepts now so largely superseded in psychiatric practice. There is need for recognition in the theory of case-workers of the part played by a love which can give security to the culprit while hating and condemning his misdemeanours. Like Dr Wall, Professor Simey commends not adjustment but commitment. He is prepared also to present as an ideal not integration with society but the revolutionary vision of the Christian faith.

How then can these things be done? One answer to this question is available in the book on *Youth and Youth Groups* completed by Macalister Brew in the last months before she died. She was one who counted Teddy Boys and Problem Girls among her friends and she gave her life in their service. Her spirit shines through pages devoted to the practical issues of club-work: committees, programmes, games, dancing, camping, parties, music, drama, crafts, discussions, radio, television and reading; but the secret motive-power of her life is revealed in the closing section on religion and the youth group. She was in no doubt that the desire to "be good" is a fundamental part of the make-up of each normal person and she sensed the longing of each adolescent to participate and to share —to give as well as to get.

A somewhat similar belief in the possibility of helping young people is shown in a manual from a marriage counsellor. In it Mrs Hacker concentrates particularly on the problems of boys and girls on the threshold of family life. Issues such as living in families, meeting boys and girls, loving and being in love, engagement, marriage and the complexities of each are faced in turn and discussed in wise and witty terms. Like the other studies reviewed above it is positive rather than negative in its implications and it also suggests hope for the future in spite of much that is distressing in the behaviour of adults and adolescents to-day.

C. M. FLEMING

The Year Book of Education (Evans Bros. Ltd., 1960, 592 pp., 63s.).

THE twenty-second issue of *The Year Book of Education* and the eighth under the joint sponsorship of the University of London Institute of Education and Teachers' College, Columbia University, is, like its predecessors, a massive tome comprising articles from 61 experts of different nationalities who have written from their own experience, unrestricted by any form of censorship from the editors. The articles are of unequal length and of varying quality and, as is to be expected in a book of this nature, there is a certain amount of overlapping. There are select bibliographies, tables and a useful index.

As to the main structure of the book, the editors have arranged the rather unwieldy mass into four sections, each preceded by a short introduction, the whole prefaced by an editorial introductory chapter outlining the general theme of the book which is "Communication Media and the School". This shows the development of communication from early times to the present day, with special mention of the work of Comenius, who first saw the importance of communication as an essential step towards universal education and, incidentally, the possibility of communication through pictorial representation—a point developed elsewhere in the book.

It would take too much space to review adequately in detail the contents of this *Year Book*. One can only touch on some of the main topics. The very close link between communication and education is evident in the two dominating themes, "the democratisation or dissemination of knowledge" and "the effectiveness or quality of communication", which are outlined first in general terms and then illustrated in more detail as case studies.

The terms of reference are not well defined and although the term "communication media" is taken in its widest sense, including even such extensions of communication as libraries, museums and so on, one tends to identify media with the new media which are in the process of revolutionising our society. The criteria which distinguish new media from the spoken word in ordinary intercourse are explained, and the tremendous implications, both social and educational, of the recent scientific and technical advances of our age are clearly stated. This makes interesting reading and repays closer study.

Much space is devoted to the influence of the new media, in particular television, radio and film, on present-day society, the first two of which play an ever increasing part in the lives of many of our youth to-day. It is recognised that such media make a direct appeal to the masses and provide ordinary people with knowledge of contemporary life far beyond their own experience. They can be, and are, used in such a way as to reduce illiteracy, hence their attraction for the young nations of Africa and Asia who see in them a partial remedy for their lack of educational

facilities and their acute shortage of teachers. These media widen horizons and offer exciting possibilities not yet fully explored.

On the other hand, there is a full awareness among the contributors of the deplorable effects that the wrong use of the new media can bring about; they can all too easily create false standards and distorted values. The disturbing influence of the wrong kind of television and radio fare on immature or insecure adolescents can be considerable, and the responsibility of those in control of the new media should be a matter of concern to all educators.

The rôle that the teacher has to play in the use of the various teaching media is also fully discussed and this aspect should be carefully examined by those who contemplate the introduction of such media in the classroom. It is not intended, at least in the majority of countries, that the teacher should be replaced by "prefabricated lessons". The new media, on the contrary, should serve as an extension or enrichment of the teacher's contribution. An interesting feature is the consideration devoted to the changed teacher-pupil relationship which occurs when the new media are in use. The impact they have on the form of the lesson, the vicarious experience they provide, the prominence their introduction gives to the spoken word and the consequent neglect of literary form, are also mentioned.

On two points there seems to be unanimity among the contributors, namely on the need for further experiment and research into the best methods of using the new media in the classroom, and secondly on the necessity for a special training of the teachers to ensure effective results. In this connexion an American even goes so far as to say that courses in the use of new media are as important to-day as were courses on the study of great literature in the past. A plea is made for a reconsideration of teaching aims in the modern world.

A representative picture of the organisation of new media in schools throughout the world is presented in the longest section of the book, entitled "Area Studies". The extent to which the new media are used in each country, however, depends on other factors, hence the wide discrepancies to be seen in the organisation and distribution of the new media in countries as disparate as France and the United States, to quote only two examples. It is evident from several of the articles that investigation and research are called for here, as little satisfaction is shown in the situation prevailing in most countries.

Selected examples of the potential of the new media are described fully in another section and these should appeal in particular to the specialist. There is a wealth of detail concerning the use and development of museum services for schools and of documentation techniques in libraries.

There are descriptions of the divers uses of tape recorders, of the place of airborne television, of the effects of typography on the motivation of children's learning, to mention only a few topics.

Some of the issues already raised are treated in detail in the section entitled "Case Studies". Here, the techniques, economics and purposes of open circuit mass television and closed circuit television are explained. Here, the modern linguist will learn more about the practical possibilities of establishing language laboratories as in the United States, or about the production of language teaching films. Here, too, we can find some of the problems concerning the sponsorship and control of the new media. The last chapter in this section is concerned with new media and their rôle in promoting better international understanding. The work of Unesco, in this connexion, merits high praise. It is clear that the schools have also a vital part to play.

There is no final summing-up in the *Year Book* and this the present reviewer finds regrettable, while fully realising the difficulty such a task would impose on the editors. Such a conclusion would, however, pull together the threads and stress once more what has been implied throughout, that whether we like it or not, the new media are here to stay. It is for us, therefore, to come to terms with them and to turn them to the best possible use. On the way we accept the challenge of the new media depends, to a large extent, the kind of men who will be the citizens of to-morrow.

This publication is a useful reference book on a subject of far reaching and vital importance. The editors, indeed, merit our congratulations and our gratitude.

N. R. EWING

J. BRONOWSKI and BRUCE MAZLICH, *The Western Intellectual Tradition* (Hutchinson, London, 1960, 30s.).

THIS is a book about the development of ideas from the Renaissance to the opening of the nineteenth century. It deals chiefly with the western European contributions to the main stream of history, and particularly with the contributions from France, Britain, Italy and Germany.

In the *Introduction* the authors claim that the book differs in three fundamental ways from other books on the history of ideas. First, it is "an intellectual history in the largest sense", not confined to ideas in one field but concerned with "the whole spectrum of the mind" and attempting to show the interplay of ideas from different fields. Secondly, the authors believe that the history of ideas must be coupled with a concrete knowledge of the events that took place at the same time and so much attention is given to historical background. Finally, new ideas are presented where appropriate in the words of their begetters, i.e. by quotations from their published works.

The result of this treatment is that the book contains a vast range of information, not only about ideas but about the lives and personalities of kings, queens, reformers, philosophers, industrialists and others. It deals with a diversity of subjects: taxation and literary style, the telescope and theodicy, Puritanism and the School of Night, the Peasants' Revolt and the Theory of Probability, doubt and the Divine Right of Kings, the Lunar

Society and monopolies—the list is endless. Yet, despite this attempt to treat the whole spectrum of the mind, the book is not truly a balanced one. There is much about science but not about theology, a lot about political theory but little about the fine arts or aesthetics. The field is in fact too wide to be treated systematically and it is remarkable, in view of the scope and the mode of treatment, that the authors have achieved so much, for, it must be said, they set themselves an impossible task. The truth is that their chosen treatment is suited to a narrow field, ideal for, say, the history of science or the development of philosophical ideas; but to attempt to expand every band in the spectrum of knowledge is unfailingly to produce blurring and distortion. What they have achieved is a series of not unrelated essays under their three headings *The Expanding World*, *The Age of Reasoned Dissent* and *The Great Revolutions*.

These essays are generally based upon the original writings of the men chiefly concerned and the text is generously supplemented, in footnotes, by critical bibliographies. The reader can thus not only obtain a picture of, for instance, the work of Leonardo da Vinci or the Puritan Revolution but receives guidance to proceed, if he so wishes, to a deeper study of these topics. The authors' aim, however, is primarily to help present an integrated history which will be of value to students of science and students of the humanities, a history which will avoid being another blow on the wedge between two supposedly opposed types of learning. In this sense the book should have much value by virtue of both scope and treatment: there is sure to be something new for everyone and the ideas are presented in their historical matrices.

The *Western Intellectual Tradition* is, for the reasons given, a broad and ambitious survey both of ideas and their translation into action in Europe during the period from Leonardo to Hegel. Its style is not exciting or distinguished; there are few arresting phrases or descriptions. Not all the problems of collaboration have been solved, as is shown by some needless repetition. It would need a reviewer with much wider knowledge than mine to assess its scholarship over the whole gamut, but in the history of science it is sometimes inaccurate in detail, particularly in regard to the invention and development of the barometer. On page 107, in their bibliography, and *passim* the authors might have mentioned Magie's *A Source Book in Physics* and also have consulted with advantage some of the early scientific papers there reproduced. A more serious defect is the failure to give due weight to the debt early science owed to Greek sources; Pythagoras, for instance, is mentioned only twice, both times incidentally, and the radical influence upon thought of Plato's realism is scarcely touched upon. Franklin's work receives generous treatment but that of Franklin's compatriot and contemporary, Count Rumford, is unmentioned, though the latter has a good claim to be called the morning star of the technological revolution. But in so vast a panorama—the index of persons contains between five and six hundred names—one must not complain

about the absence of a name here and there. On the other side of the account it is altogether pleasing to find interesting description of such groups as the School of Night and Birmingham's Lunar Society.

This book can be recommended for leisurely and careful reading to those who wish to gain increased understanding of some of the main formative ideas which have produced our present world and way of life. Dr. Bronowski in print may not be so vivid as Dr. Bronowski on the television screen, but he is here more permanent and bountiful and he can be summoned at will to present his ideas by those who, still wishing to possess books, acquire this one.

W. J. SPARROW

W. R. LEE, *Spelling Irregularities and Reading Difficulty in English* (Occasional Publication No. 2, National Foundation for Educational Research, London, 1960, 10s.).

Is the chaotically inconsistent connexion between a phoneme and its representing letter in English a major cause of children's reading difficulties and a barrier in the way of rapid progress in reading? This question is the point of departure for Dr Lee's investigation sponsored by the Simplified Spelling Society.

A survey of the literature yielded little information. Such experimentation as there had been with simplified spelling, meagre and poorly controlled, led Dr Lee cautiously to infer the probability of accelerated progress in word recognition, "and perhaps in reading generally", under a simplified-spelling-phonic-method régime.

Unrewarding, too, was an attempt to make inter-language comparisons. Degree of phonetic regularity in spelling is but one of a multiplicity of interwoven factors making comparisons "difficult if not impossible".

The main part of the inquiry is concerned with a classification of children's reading errors on the basis of the degree of regularity of spelling of the words misread. Results showed a "slightly stronger tendency" for the children to fail at irregularly spelt words. Testing materials included continuous texts and words in isolation. The basic assumption on which this analysis rests is that the sole function of the written word is to faithfully represent sounds. Bradley has labelled this as a "spurious truism" and Dr Lee insists that this assumption is made "rightly or wrongly" solely for the purposes of the investigation, that reading is something more than making vocal responses to visual stimuli, that meaning is grasped from a complex of interrelated patterns of signals from the printed page.

Lastly, children were asked to spell ten nonsense words containing a variety of English phonemes. The frequencies of the children's predictions for the spellings of a given phoneme did not closely reflect the frequencies built into the language.

The burden of the evidence from this investigation is that irregularity of spelling is but a minor cause of reading difficulty. Dr Lee in no way

suggests that this is the final answer to the question originally raised. A crucial experiment in this field, necessarily large-scale and long-term, would presumably have meaningful reading as the dependent variable, and methods of instruction and orthographic systems as independent variables. Meanwhile, this present careful and thorough investigation clearly makes an important preparatory step.

B. COOPER

M. W. RANDALL, *Modern Ideas on Physical Education* (Second edition, revised. G. Bell and Sons Ltd., 1960, 10s. 6d.).

OVER the last few decades physical education has been increasingly recognised as one of the important aspects of the general education of young people and this has stimulated considerable thought, initiated many experimental investigations and altogether resulted in a mass of literature on the topic. Unfortunately, for the student and beginner teacher, it is not always possible to locate all this literature, nor, having found it, to assess its real value. With this in mind, Mr Randall produced the first edition of this book. In it he discussed a number of topics in physical education which he regarded as important, his primary aim being to stimulate and guide student thinking and reading about such topics.

Since the appearance of that first edition almost another decade has passed, there have been more investigations and a great deal more constructive thinking, and the need has now arisen for the re-assessment of some of our ideas. In this revised edition, which is by no means a mere re-hash of his earlier venture, Mr Randall once again attempts to guide reading and stimulate thinking. Most of the earlier topics are retained but more prominence is given to child growth and development. He stresses the importance of individual differences and shows how a wide variety of physical activities is essential to cater for such differences. By this means he is able to justify the inclusion of such widely differing approaches as circuit training on the one hand and movement approach on the other.

Mr Randall's views will not be acceptable to all his readers. For example, psychologists, especially those concerned with selection at 11 plus, are likely to disagree with him when he says of secondary education that "little attempt is made to assess the 'whole' child, selection being arbitrary and according to an intellectual prognosis generally recognised to be as haphazard and inaccurate as are the prophecies of most tipsters . . ." (p. 34) and many physical educationists will fail to be impressed by his argument for the inclusion of boxing in schools (Appendix C, p. 152). Even so this is a valuable little book; it achieves one of its primary objectives, namely, to make the reader think. In addition, a fairly extensive bibliography is included to encourage further reading by the keen student; indeed it is a book that can be recommended.

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JOURNAL OF THE INSTITUTE
OF EDUCATION
UNIVERSITY OF BIRMINGHAM

EDITORS

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JUNE 1961

VOLUME 13 • NUMBER 3

UNIVERSITY OF BIRMINGHAM
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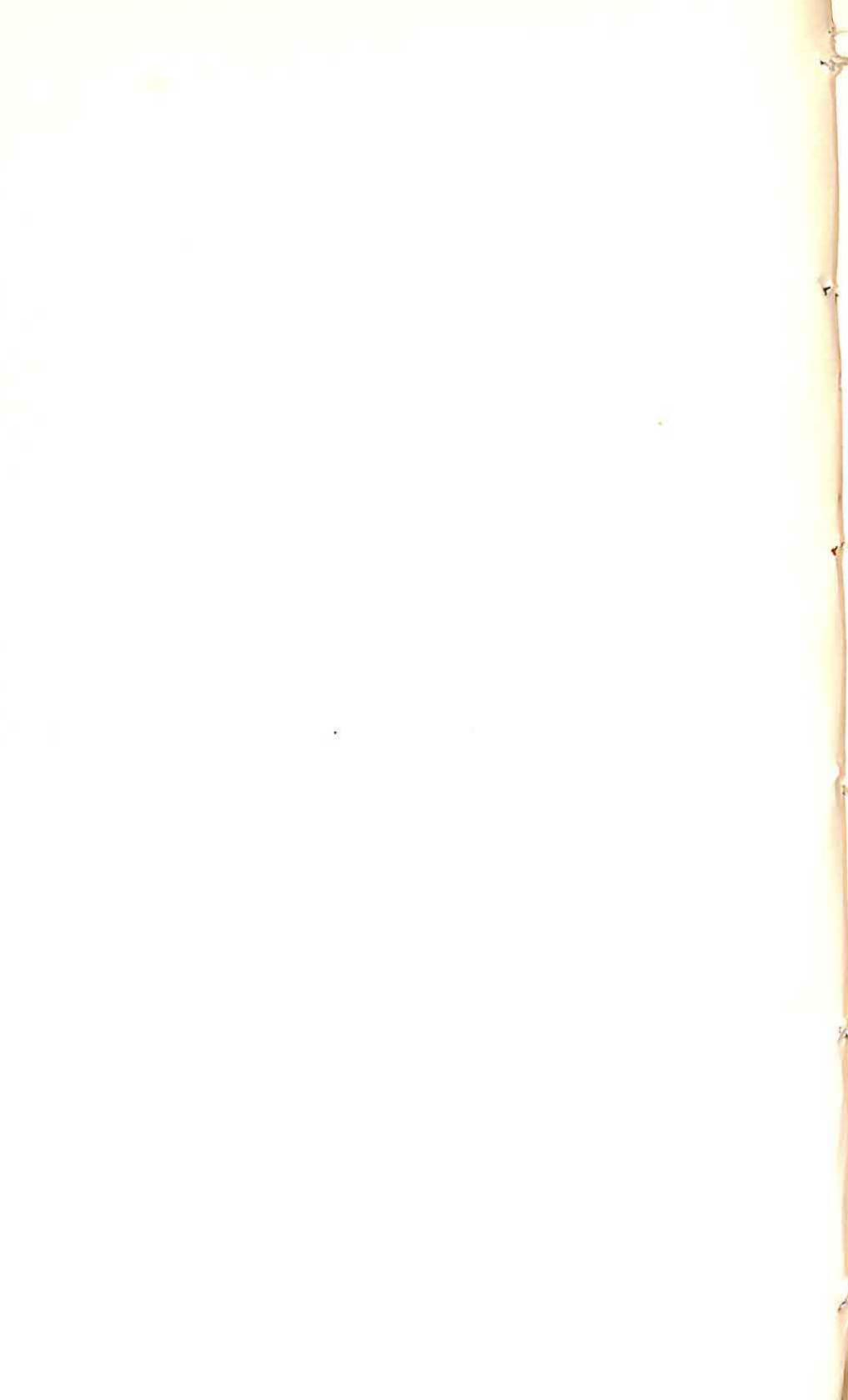
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SIXTH FORM ENGLISH AND UNIVERSITY ENTRANCE

by E. A. HEWITT

Lecturer in Education, University of Durham

1. INTRODUCTION

DETAILS have been given elsewhere (1) of the performance of some 1,400 boys, who subsequently entered British universities, in the Cambridge O level examination in English Language. It appeared that a statistically-significant difference in standards of written English between those who later specialised on the arts side and those who studied science could be detected at least as early as the age of 15. This finding calls for some modification of the view that disparity in standards of written English as between arts and science graduates is entirely due to the pursuit of different lines of specialisation in the sixth form and at university, and it seemed worth while to try to trace the development of some of these boys up to the point at which they left school. The data obtained are not ideal for statistical treatment, but may be of interest partly because of the size of the sample and partly because the results of the enquiry bear, however lightly, on the "Use of English" papers which may eventually confront all candidates for admission to a university.

2. THE SAMPLE

The only readily accessible criteria were the results in the Cambridge Syndicate's "General" and "Use of English" papers (hereafter referred to as G and U) in the years 1955-57. Both these papers were compulsory for A level candidates seeking State Scholarships, but were also taken by many students who could have had little hope of achieving such distinction; it seemed that in some schools all A level candidates took G as a matter of course, two years after taking the O level paper in English Language.

Schools which sent relatively few candidates to university were ignored, and since in any case some pupils in the original sample appeared not to have taken either G or U, the final sample was reduced to 887 boys who had sat for one or the other, or both. A few of these

boys took one or both papers one year after passing in English Language at O level, others had three years between the two levels, and some took G and/or U in two or even three consecutive years. The 887 boys came from 45 different schools—33 maintained grammar schools (3 of them mixed), 6 direct grant schools, 5 independent schools for boys, and one independent mixed school.

The examination results were published in terms of nine grades, the most successful candidates appearing in grade 1, and grades 6-9 including all the failures. The performance of the 887 candidates at O level is shown in Table 1, and the final sample can be taken as an unbiased selection from the original one as far as O level results are concerned (2). Only the results of first attempts at the paper are recorded in the table; candidates initially placed in grades 6-9 were successful later.

TABLE 1

PERFORMANCE OF 887 BOYS IN THE ENGLISH LANGUAGE EXAMINATION AT O LEVEL

Boys later specialising in	% of candidates placed in the grades indicated						Total Nos.
	1	2	3	4	5	6-9	
Arts	12	19	30	17	14	7	348
Science	5	12	28	22	21	11	539
Totals	8	15	29	20	18	10	887

3. SCOPE OF THE EXAMINATIONS

The G paper, designed primarily to test maturity of thought and expression rather than general knowledge, offered a choice from eight or nine topics in each of the two questions to be answered in $2\frac{1}{2}$ hours. Question 1 called for a "composition" on one of such subjects as "Advertising as a fine art", or "The scientific attitude of mind", or such statements as "The world does not owe the British worker a living". Question 2 could involve recording an imaginary discussion, for instance on unofficial strikes, writing a debating speech to a given motion, or outlining in a report a proposed solution to such a problem as the conservation of the world's supplies of raw materials. The U paper appeared to afford less scope for individuality and imaginative power, and provided no parallel to the academic essay required in question 1 of the G paper. Skill in composition was tested, but much of the material needed was available—sometimes in pictorial form—in the question paper. U appeared to test ability to use language effectively for fairly closely controlled purposes, whereas in G one would expect a candidate's range of specialist knowledge and his own original thought to play some part in determining the final mark.

4. EXAMINATION RESULTS

The majority of the candidates took their papers two years after their first attempt at the O level paper in English Language, and the results, for arts and science students separately, are shown in Tables 2 and 3, which also show the O level grades previously awarded for the Language paper.

TABLE 2

RESULTS FOR 556 CANDIDATES WHO TOOK THE U PAPER 2 YEARS AFTER THE O LEVEL PAPER IN ENGLISH LANGUAGE

O level English Language	Arts candidates						Science candidates					
	No. of candidates placed in the U grades indicated						No. of candidates placed in the U grades indicated					
	1	2	3	4	5	6-9	1	2	3	4	5	6-9
1	3	11	15	6	1	—	36	16	1	4	7	6
2	3	8	23	10	5	4	53	24	—	5	20	11
3	—	9	24	17	8	5	63	29	—	6	29	34
4	—	4	9	9	7	2	31	14	2	2	14	25
5	1	2	3	13	2	2	23	11	—	1	8	22
6-9	1	1	3	4	4	—	13	6	—	—	2	11
<i>Totals</i>	8	35	77	59	27	13	219		3	18	80	109
<i>Nos.</i>	4	16	35	27	12	6		100	1	5	24	43
<i>%</i>	4	16	35	27	12	6			1	5	24	32

TABLE 3

RESULTS FOR 742 CANDIDATES WHO TOOK THE G PAPER 2 YEARS AFTER THE O LEVEL PAPER IN ENGLISH LANGUAGE

O level English Language	Arts candidates						Science candidates					
	No. of candidates placed in the G grades indicated						No. of candidates placed in the G grades indicated					
	1	2	3	4	5	6-9	1	2	3	4	5	6-9
1	5	10	19	4	1	—	39	14	—	4	14	5
2	4	12	20	14	11	1	62	22	—	3	21	16
3	1	5	28	25	15	3	77	27	—	5	27	46
4	1	4	16	12	11	1	45	16	—	1	11	25
5	1	2	8	15	9	1	36	13	—	1	12	22
6-9	—	1	4	7	8	2	22	8	—	—	1	5
<i>Totals</i>	12	34	95	77	55	8	281		—	14	86	119
<i>Nos.</i>	4	12	34	27	20	3		100	—	3	19	37
<i>%</i>	4	12	34	27	20	3			1	5	24	15

(a) The U paper

As one would expect from the O level results, there are many scientists who can do well in an examination in English, and some

arts men who cannot. As a group, the scientists certainly obtain inferior results ($\chi^2=44.8$ with 4 degrees of freedom, $P=0.001$) (3); arts specialists are roughly three times as likely as are scientists to be placed in grades 1 or 2, and the scientists are twice as likely to fail. But only the crudest of estimates can be made of the extent to which the difference between arts and science students can be accounted for by a difference already existing at O level (4). A rough estimate of the scientists' losses over the two years between O and U papers can be made, however.

For both arts and science students, mode and median at O level are located in grade 3, in which roughly 30% of each of the two sets of candidates are placed, as Table 2 shows. The U median for these arts men is near the bottom of grade 3, while for the scientists the U median is half way down grade 4, so that they have lost half a U grade compared with arts students of similar standing at O level. Similar calculations for the arts and science students in the other O level groupings shown in Table 2 give U differences of between one-third and three-quarters of a grade, so that the average loss suffered by the scientists is probably in the region of half a grade—not more than three or four marks on the marking scale, which extends in theory from 0 to 100 (5). The average loss in the sixth form, calculated in this way, is perhaps unexpectedly small, and one might argue that the methods in use in the schools five years ago, in an effort to minimise differences between arts and science students in respect of ability to write English, achieved a considerable measure of success. The difference between the U medians for the 219 arts men and the 337 scientists is roughly three-quarters of the range of marks covered by U grade 4; the arts men were already superior at O level, and one would expect that superiority to become more marked with the passage of time, even if both groups had followed the same curriculum. The range of ability far exceeds the difference between groups, and the real problem is that so many poor writers of English are entering universities; this is not purely the consequence of narrow curricula and restrictive syllabuses in the Science sixth.

(b) *The G paper*

The distributions (Table 3) for arts and science candidates taking this paper two years after the O level paper are significantly different ($\chi^2=98$ with 4 d.f., $P=0.001$). The difference between the arts and science G medians is roughly the range of marks covered by G

grade 4, and the difference between arts and science students of comparable standing in the O level paper varies from roughly half a G grade to a full grade. The G and U distributions for the arts men who took *both* G and U two years after O level are practically identical ($\chi^2=0.18$ for 3 d.f., and $P=0.98$). For the scientists who similarly took both papers two years after the O level paper, the G mode and median are appreciably lower than those for the U paper, and though the failure rates for the two papers are comparable, it is more difficult for a scientist to obtain a fourth or higher grade in G than in U ($P=0.01$). One can conclude that the scientists find G more difficult than U, and perhaps that, in addition to a limitation in linguistic skills which are tested by U, they are handicapped by relative inexperience in using the essay form, and possibly by a less adequate training, as compared with the arts candidates, in thinking about the kind of problems posed in the G paper.

Fifteen per cent of the scientists fail in G, but nearly half of these failures are accounted for by the 29% of scientists who took G but not U, and who were therefore, presumably, not thought to have any chance of obtaining a State Scholarship. These "non-U" scientists achieve poorer results in G than the scientists who took both papers; the difference in medians is the equivalent of half of grade 5 ($\chi^2=14.9$ for 1 d.f., $P=0.001$). Similar considerations apply to the 30% of arts men who took G but not U, the difference in medians being equivalent to half of grade 4 ($\chi^2=12.1$ for 1 d.f., $P=0.001$). General academic ability, however, as indicated by fitness to apply for a State Scholarship, appears to be a relatively poor index to performance in G, since the tetrachoric correlation is only 0.3.

(c) *The effect on scientists of a 3-year course after O level*

One can assume that the bulk of the candidates who took their G and/or U papers three years after the O level paper had followed an "express" course up to O level, that they would on the whole be the abler candidates, and should also be superior linguistically to those who took their G and U papers two years after the O level paper. Comparison of the 2-year and 3-year G results for scientists shows that the 3-year candidates do slightly better, though the difference could be expected to occur in 30% of random samples. There is no difference between the performances of the two groups in the U paper, the two distributions being very similar ($P=0.99$), and the 3-year group has lost the whole of any initial advantage it may have had by virtue of its superior general academic ability.

Admittedly, it cannot be shown that the "express-route" scientists originally had any superiority in the verbal sphere. When one examines the performances of the two groups in the O level Language paper, it is clear that the "express" group cannot do in four years what the others can accomplish in five. Candidates taking a five-year course are seven times more likely to achieve a grade 1 award, the difference between medians for the two groups is almost half of grade 4, and χ^2 for the two distributions reaches 8.0 for 2 d.f. ($P=0.02$).

5. RELIABILITY OF TESTS OF ENGLISH

Table 4 shows the correlations between papers. Because of the form in which the data were obtained, it has been necessary to use tetrachoric r , with all its attendant disadvantages. The size of the correlations may have been further influenced by differences between school means.

TABLE 4
CORRELATIONS BETWEEN PAPERS

	General paper		Use of English paper	
	r	Nos.	r	Nos.
O level English Language	.46	742	.45	556
General paper	.61	234	.68	703
Use of English paper		—	.56	124

The O-G and O-U correlations are for candidates who took G or U two years after O level. G-G and U-U correlations are for candidates who took these papers twice, in successive years. The G-U correlation is for candidates who took both papers in any one year.

The O-U correlation perhaps seems low, even for examinations with a two-year interval between (6), but it does not necessarily follow that the tests have little in common. In the first place, the fact that arts and science students have followed different courses is likely to upset the correlation. Secondly, compared with all candidates taking the O level paper, the sample for which the correlation is obtained is a selected one; 10% of the university entrants fail, for instance, as compared with 40% of all the boys who take this paper. But obviously this does not explain why a candidate who fails at O level is placed in grade 1 for the U paper two years later (see Table 2), or why a grade 1 candidate at O level eventually fails the U paper.

The test-retest reliabilities for G and U are disappointingly low.

EDUCATIONAL REVIEW

JOURNAL OF THE INSTITUTE OF EDUCATION
UNIVERSITY OF BIRMINGHAM

Volume Thirteen
SESSION 1960-61

UNIVERSITY OF BIRMINGHAM
5 GREAT CHARLES STREET, BIRMINGHAM, 3



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With a reliability coefficient of .56 for U, and a standard deviation perhaps conservatively estimated at 10, the 5% confidence limits on either side of the pass mark would be ± 13 , and the "true" score of a candidate placed in grade 9 might be higher than the pass mark of 45. There seems to be little justification for correcting the coefficient for selection effects, since it was not only moderate or weak candidates who made a second attempt at the paper. But the year which elapses between tests, and the possibility that some candidates who have already obtained a reasonable result in the first test will not extend themselves when they take the second (7), lead one to suppose that .56 is too low an estimate of the reliability, and the correlation of .68 between G and U taken in the same year supports this view. But one might well doubt whether, when several examining bodies produce their own independent versions of a "Use of English" paper, an effective reliability coefficient in excess of, say, .75 will be possible. Such a coefficient would imply 5% confidence limits of ± 10 ; a coefficient of .86 would only reduce them to ± 7.5 , so that a candidate placed in grade 8 could have a "true" score as high as the pass mark, and another in grade 4 might be fortunate to have escaped failure; to reduce the confidence limits to ± 4 the fantastically high coefficient of .96 would be required. The margin of error may be too wide to justify making entrance to a university conditional upon the mark obtained for a single paper appearing in various guises under the generic heading "Use of English".

6. SUMMARY OF RESULTS AND CONCLUSIONS

(a) In this sample of university entrants, the range of ability in English far exceeds the average difference of perhaps half a grade between arts and science specialists. At the same time, the proportion of scientists whose written English falls below the minimum standards considered appropriate for the award of State Scholarships appears to be at least twice as high as for arts students.

(b) Whereas for arts students the G and U papers are of equal difficulty, G is perhaps the more severe test for scientists. Even so, roughly half of them do better than the lowest fifth of the arts men.

(c) Scientists who presumably took a 4-year course leading to the O level paper in English Language achieved significantly inferior results in that paper to those obtained by candidates taking a 5-year course. If, as would be expected, the "express-course" scientists were on average better in English than the rest at one point in their school careers, they yet had no advantage in English, by the time they

left school, over scientists who are presumed to have taken a 5-year course up to O level and then spent only two years in the VIth form.

(d) The evidence relating to the reliability of G and U is not conclusive, but it seems likely that "Use of English" papers, especially when produced by several different boards, may not discriminate very accurately between applicants for admission to universities.

(e) General academic ability and performance in English are related. If universities in general were to demand a higher qualification in English than the present pass in the Language paper at O level, and the schools responded by trying to improve the English of their less literate VIth formers, we might well be faced with a poorer performance in specialist subjects by candidates who can least afford it under present conditions of highly competitive entry to universities.

NOTES AND REFERENCES

1. "The performance in English Language, at O Level, of a Sample of University Students", *Brit. Journ. Educ. Psychol.*, XXX, 40-46.
2. Arts men make up 39% of the original sample, 39.2% of the reduced sample; for arts men, the difference between the two samples in terms of examination grades would be exceeded in 95% of random samples, and the corresponding difference between the two groups of science students would be exceeded in 99% of random samples.
3. 271 candidates, including some whose 2-year results are recorded in Table 2, took a U paper 3 years after the O level examination. Again, arts students were superior to scientists ($\chi^2=27.2$ with 4 d.f., $P=0.001$).
4. Means and mean differences cannot be calculated, nor can regression effects be allowed for—a glance at Table 2 will suggest that the correlation between O and U is rather low—and it is likely that the O and U scales are not directly comparable.
5. One can assume that since grades 2, 3, 4 and 5 each cover relatively narrow ranges of marks, science students placed in any one of these grades at O level do as well, on average, as arts men placed in the same grade. One cannot apply the same argument to candidates in grade 1, or to those grouped together in grades 6-9. The losses may be heavier in the case of scientists at the extreme ends of the O scale.
6. The O-G and O-U correlations for examinations *three* years apart are still 0.40 and 0.43 respectively.
7. It is disturbing to find that for both U and G papers one quarter of the candidates are placed at least one grade lower for the second attempt than the first, and that another one quarter are awarded the same grade on each occasion.

OBJECTIVE TESTS IN THE PRIMARY SCHOOL

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I. THE DEVELOPMENT OF MENTAL TESTS

IT is just over half a century since the first attempts were made to express in quantitative terms the differences long known to exist between one personality and another. The mental testing movement of the early twentieth century had two main origins. On the one hand, Charles Spearman was attempting to find a measure of that fundamental human ability which was responsible for the fact, fully established yet even now not universally accepted, that all abilities are positively correlated—that he who excels in one ability is likely to have the capacity for better-than-average performance in every other field as well. At the same time, in France, Alfred Binet was engaged on the more practical project of devising a set of miniature tasks or problems which would facilitate the identification, at an early age, of the educationally subnormal children in the schools of Paris. Thus for Binet at any rate, the motive for test-making was the need of the schools—a fact sometimes forgotten by ill-informed critics.

In the ensuing fifty years, the twin streams of Spearman's and Binet's work have joined and swollen into a torrent. "Tests" have become a commonplace device for vocational selection and guidance, for checking the progress of schoolchildren, for ascertainment of mental deficiency, for diagnosis of retardation and of emotional maladjustment, for allocation to secondary schools, for comparison of the effects of different methods of teaching, for analysing the nature of human abilities. The magnitude of the flood may be assessed by the fact that the latest (fifth) edition of the Buros *Yearbook* (1) (an indispensable reference book for test-users), lists 1000 different tests, and these are limited to those published in English, chiefly in Great Britain, Australia, Canada and the United States of America. Nor are successive issues cumulative; The previous edition (1953) contains references to many tests still current, but not listed in the fifth

Yearbook. The enormous expenditure of human ingenuity and effort in the making and taking of tests in these fifty years can be imagined.

Yet the development of mental testing has not gone uncriticised. Some teachers still maintain that they know their pupils so well that tests can tell them nothing: some refuse to accept the long-familiar fact that all men are not born equal even in potential ability. Some deplore the whole development of mental testing as a mere pastime of psychologists foisted on the unwilling schools, forgetting that the demand for the production of tests originated in the schools themselves, and that the interference of mental tests in the life of children should be—like education itself—an interference in the interest of greater fulfilment and happiness for the learner. The recent reaction against objective tests in the “eleven-plus” is too well-known to need elaboration, but the move in some areas to replace objective tests by those same unsatisfactory techniques which they were introduced to supersede is a “reform” of selection procedure only in the sense that it will make the inevitable blunders in any selection scheme less easy to detect.

The purpose of the present article, however, is not to advocate or justify the use of standardised tests (2). On the contrary, it arises from the fact that despite all criticisms, there is a steady demand from teachers for greater information about tests of intelligence and attainment suitable for use in school. It is not easy to find out what tests are available, nor to choose those most suitable for one's purpose. No attempt is made here to deal exhaustively with all tests available; a selection of good reliable tests is offered to enable the teacher in the primary school to assess the major measurable aspects of his pupils' ability to learn, and of their success in learning. It should not be inferred that the teacher's own judgement becomes superfluous if tests are used. The ideal—to quote from the manual of one of the tests recommended—is “to bridge the gap between those who rely largely upon observation and personal judgement in assessing a child's ability and those who accept the limited information of quantitative scores on standardised tests as being the major issue in diagnosis” (3).

2. THE VALUE OF ATTAINMENT TESTS

In discussing the uses of objective tests we are not here attempting to indicate the uses of tests in general but are merely suggesting the use that may be made of the tests described in the ensuing pages. Tests of attainment in school subjects may seem more difficult to justify simply because any teacher can and does construct tests in the

subject-matter he teaches, while "intelligence" is a mystery which he would not presume to define—far less to measure. Yet it is difficult to assess objectively and speedily the attainments of children in school subjects. Thus a battery of objective tests of attainment administered to children recently admitted to his class, gives a teacher speedy information as to the extent and nature of deficiencies, while a similar survey of children well-known to him may defend him (and them) against the danger of seeing the attainments of the co-operative and responsive child through rose-coloured spectacles. For these purposes, involving only comparisons within the class, tests which are objective and speedy in administration and marking may be sufficient, and norms in the form of attainment ages or quotients may be superfluous, but it is never easy for a teacher to bear constantly in mind (or indeed to be aware of) standards of attainment outside the class and school in which he teaches, and if he wishes to assess the standards achieved by his class as a whole in relation to the average attainments of a wider population, then he must choose a standardised test with norms still valid for the time and place in which he wishes to use it.

It should be noted in this connexion that some very well-known and well-standardised tests may be so old that their norms have become quite out of date either because of changing standards of attainment in the schools (e.g. following wartime interruptions of schooling) or of a general increase in test-sophistication, producing higher scores than in earlier years.¹

The use of tests in say, reading and arithmetic, standardised on the same or comparable populations, give some indication of relative deficiencies in particular subjects in a class as a whole.

Thus the attainment tests suggested are useful for assessment of the extent and nature of weaknesses, for dividing a class into sets or groups or an age group into streams and for indicating in what subjects the teacher's efforts should be intensified (or relaxed) if he accepts the attainments of other children as an appropriate target for his own.

3. WHY USE "INTELLIGENCE TESTS"?

For allocation to "sets", a measure of the level and nature of present attainment is usually adequate, but for streaming, or any other form of selection for more permanently segregated groups,

¹ Such tests, however, may still be valuable for speed and objectivity if the norms are ignored.

assessment of present level must be supplemented by prediction of future potential achievement. For this purpose, the inclusion in the assessment battery of one of the tests known as "intelligence tests" improves the accuracy of prediction—and the more so if a long term prediction is required (4). A test used for this purpose need not be validated by proving its conformity to any accepted definition of intelligence; it is only necessary to produce "follow-up validation" of its predictions—to show, in fact, that children who do well in this test have a greater probability of doing well in the type of work for which they are being assessed. Such a test therefore, need not be labelled "intelligence" at all; whatever its designation and however bizarre its content, a test with high follow-up validity justifies itself as a good predictor of scholastic (or vocational) aptitude, and furthermore, if this prediction of aptitude is the only purpose for which we propose to use the test-results (a limitation which calls for restraint in the use of a term like "I.Q." in reporting the results) it makes no difference how we define intelligence or what view we hold of its structure and modifiability. Acceptance of this fact, and acknowledgement of the folly of making wide-ranging predictions from a limited measure of intelligence is increasingly prompting the abandonment of the use of the word "intelligence" as a description of a test, and the substitution of a more empirically-defensible designation such as "scholastic aptitude", or (less justifiably perhaps) "reasoning ability".

When we use intelligence tests along with attainment tests not for the purpose of combining them into a better predictor of academic success, but with the intention of contrasting the results to diagnose "underfunctioning" or "retardation", we are on more difficult ground, and in the midst of a vigorous current controversy (5). The fact that differences in ability between one person and another are substantial and ineradicable (whether inherited or not) has been slow to gain acceptance, and one can still occasionally hear students discussing how to modify teaching methods so as to ensure that all the pupils in a class may be brought to the same standard, but most of the older hands at teaching have long since abandoned the faith that all are born equal, and accept with varying degrees of cynicism that the only common level attainable by all is zero. It is more difficult to accept the fact of ineradicable discrepancies between different abilities in the *same* person. Yet it is well known that the correlation between different abilities is not perfect and it follows that if a child scores higher (in relation to the norm) on one test than on another, there is

no need to find a *reason* for the difference. (Reasons cannot always be found, either, for individual differences *between* persons.) However, the larger the discrepancy found between scores in one test and in another, the greater the probability that some modifiable cause *for* it may be found. Teachers have long been accustomed to this sort of diagnostic use of examination marks. If two children have 30% in mathematics, the one who gains 80% in English is likely to be thought more capable of improvement than the one whose English mark is also 30%. In the same way, if two ten-year olds have a reading age of six, and one of them can equal the average ten-year old in a test called "intelligence", this gives hope of possible improvement in reading, especially if the structure of the reading test is inclusive of the abilities in the intelligence test, so that the intelligence test can therefore be regarded as a measure of *some* of the abilities involved in reading, or—to put it otherwise—that the intelligence test can be regarded as relatively unaffected by some adverse influence (such as unsuitable methods or motivations) which depress attainment in reading. This relative immunity of the intelligence test may justify its use along with attainment tests, as a measure of remediable retardation, but it should be remembered that if no successful remedial treatment is undertaken, the high score in the intelligence test would still be a poorer prediction of academic success than the low score in the attainment test.

The use of non-verbal tests of intelligence to assess the potential mental capacity of poor readers is often criticised on the grounds that such a test is not "included", in the sense used above, in the attainment test; its structure tends to go beyond that of the attainment test in that it uses diagrams or picture-puzzles which may involve a special factor of spatial ability which is not greatly involved in learning to read. Thus a high score in a non-verbal test of intelligence might merely imply a well-developed spatial factor which would not justify hopes of improvement in reading. On the other hand, in the case of children "inaccessible" by an ordinary group verbal test of intelligence—for example, blind children, non-English-speaking immigrants, or illiterate children from a slum or gipsy home where reading is practically an unknown skill—the use of a non-verbal, or at any rate a non-reading, test of intelligence, may be the only possible way of assessing the child's probable capacity to make use of learning opportunities not previously available to him. In such a case, discrepancy between scores on a non-verbal intelligence test and on an attainment test may be a valid measure of remediable retardation.

4. TRANSFORMATION OF TEST NORMS

It has been pointed out that when a test is used solely for internal grading or grouping, there is really no need for it to have norms at all, but if these are required in order to compare class (or school) results with a wider population, or to facilitate the comparison of intelligence with attainment scores, there is no need to reject an otherwise suitable test merely on the grounds that the norms provided with it are not in the preferred form. Most test-norms are shown in the form of mental or attainment ages, percentiles, or standardised scores (now generally referred to as "deviation quotients") and it is usually a simple matter to transform any one of these into any of the others, on the basis of the customary assumption that the score distribution corresponds roughly to the normal frequency curve. An example worked out with the aid of Table 1 will make this clear.

TABLE 1
PERCENTILE AND DEVIATION QUOTIENT EQUIVALENT

(A) Percentile	5	12.3	5	10	16	25	50	75	84	90	95	97.7	99	99.9	
(B) Deviation Quotient (SD 15)	57	61	65	70	75	81	85	90	100	110	115	119	125	130	135
(c) Deviation Quotient (Cornwell: SD 16.5)	57	61	67	73	79	83	89	100	111	117	121	127	133	139	143

It should be borne in mind, first of all, that the types of norm shown in Table 1 usually incorporate an age-allowance, whereas raw scores and mental or attainment ages do not. Thus in transforming from one of these groups to the other (in either direction) the chronological age of the child tested must be taken into account.

Suppose, for example, that Raven's Standard Progressive Matrices Test has been given to a group of eleven-year old children. The norms in the manual show the following equivalents:

Raw score:
Percentile:

14	16	26	35	41	47	50
5	10	25	50	75	90	95

If it is desired to compare the results of this test with another test providing "deviation quotients", the corresponding values for the raw scores listed in Raven's Manual can be read off from row (B) of Table 1 (below the entries 5, 25, 50, 75, 95 in the Percentile Row) and substituted for the percentiles, thus:

Raw Score:
Deviation Quotient:

TABLE 3

14	16	26	35	41	47	50
75	81	90	100	110	119	125

If quotient equivalents of intervening raw scores are required, a sufficiently close approximation may be made by drawing a graph linking the two sets of values given in Table 3, the adjacent points being joined by straight lines. The deviation quotient corresponding to any Raven's Raw Score between 14 and 50 may then be read off from the graph. (For example, the "deviation quotient" corresponding to a Raw Score of 45 would be 116). A disadvantage of norms of this type is that quotients for scores below 14 or above 50 can only be approximately assigned by extrapolation, and it is best to record these simply as "less than 75" or "more than 125".

If the test is also used with other age groups, a similar graph (based on the appropriate age-column in the Raven's Matrices Manual) must be drawn for each.

It is sometimes useful to make a further transformation of the deviation quotient into an approximate mental age.¹

This is simply a matter of applying the arithmetical formula $IQ = \frac{MA}{CA} \times 100$, but the operation is facilitated by the use of an inexpensive set of published tables (6). These same tables may similarly be used to save the labour of computation in transforming age-norms into quotients.

5. RECOMMENDED TESTS

The tests included in the following list are all easy or fairly easy to administer; the information given about each (so far as available) is as follows:

Name of the test; author; publisher (see list below for address); date of publication or of latest revision; whether group or individual test; approximate age-range; approximate time required (including a margin for the issue of material and instructions); type of norm provided; cost of manual (including all necessary scoring-keys); cost of pupil's non-consumable test booklet (if applicable); running cost of consumable material, per child tested.

The cost of consumable material, and of pupils' non-consumable booklets for *group* tests, are calculated on the basis of a purchase of at least 25 copies. For larger quantities, these costs may be lower; for smaller quantities, they may be considerably higher. All costs are of course subject to price fluctuation.

¹ This is not strictly comparable with a true mental age (as, for example, the Moray House and Deeside Test Manuals point out) but it is found useful by those who are more familiar with the popular "mental age" concept than with the standardised deviation quotient.

This information is given for guidance only and should be verified from publishers' catalogues before purchasing.

The omission of any test from this list does not imply unsuitability.

(a) *Verbal Tests of Intelligence*

These are particularly easy to administer, involving usually only the issue of printed booklets, the reading of one set of instructions, and scoring from a key. Some are appreciably "contaminated" by school attainments, but they are not thereby invalidated as measures of potential scholastic success.

1. Essential; F. J. Schonell; O and B¹; 1940; Group; Junior; 50 minutes; Mental Age; Two Forms; Manuals A 1/6, B 1/6; Cost per test 6d.

2. Simplex Junior; C. A. Richardson; H; 1932; Group; Junior and Secondary; 50 minutes; Mental Age; Manual 1/-; Cost per test 4½d.

3. Simplex Junior A; C. A. Richardson; H; 1951; Group; Junior and Secondary; 50 minutes; Mental Age; Manual 1/-; Cost per test 5½d.

4. Maddox Verbal Reasoning; H. Maddox; O and B; 1960; Group; Top-Junior; 50 minutes; Deviation Quotients; Manual 1/9; Cost per test 6d.

5. Primary Verbal Test 1; D. A. Pigeon; N.F.E.R.; Group; Junior; 45 minutes; Deviation Quotients; Manual 1/-; Cost per test 5½d.

(b) *Intelligence Tests not requiring reading*

The teacher's concern with these tests will normally be limited to an attempt to assess the mental level of children to whom the material of a verbal test cannot be communicated, for example those who because of foreign background or sensory or environmental handicap have not yet attained a facility in reading roughly equivalent to a reading age of nine years. For all such children an individual test competently administered by a psychologist or a specially trained teacher would be preferable (7), but this is not always available, and a group non-reading test may give a good enough first estimate of mental capacity.

6. Moray House Picture; M. Mellone; U.L.P.; 1944; Group; Top-Infant; 75 minutes; Deviation Quotients and Mental Age; Manual 1/3; Cost per test 1/-.

¹ Publisher: For full name and address see Section 6 of this article.

7. Deeside Seven-Plus Picture; W. G. Emmett; H; 1958; Group; Top-Infant; 65 minutes; Deviation Quotients and Mental Age; Manual 3/6; Cost per test 9d.
8. Picture Intelligence Test; J. E. Stuart; N.F.E.R.; n.d.; Group; Top-Infant; 45 minutes; Deviation Quotients; Manual 1/-; Cost per test 10d.
9. Sleight Non-Verbal; G. F. Sleight; H; 1931; Group; Junior; 75 minutes; Mental Age; Manual 1/-; Cost per test 9d.
10. Non-Verbal Test 5; D. A. Pidgeon; N.F.E.R.; Group; Junior; 45 minutes; Deviation Quotients; Manual 1/-; Cost per test 10½d.
11. Group Test for Juniors (Orally-Administered); Cornwell; Methuen; 1952; Group; Junior; 5 x 20 minutes; Deviation Quotients (SD 16.5); Manual 3/6; Non-Consumable; Cost per test Nil.
12. Junior School Test (Orally-Administered); T. P. Tomlinson; U.L.P.; 1953; Group; Junior; Manual 1/6; Cost per test 1½d.
13. Standard Progressive Matrices; J. C. Raven; Lewis; 1956; Group; Junior to Adult; 30 minutes; Percentiles; Manual 3/6; Pupil's Non-Consumable booklet 7/-; Cost per test 2½d.
14. Coloured Progressive Matrices; J. C. Raven; Lewis; 1956; Group; Junior; 20 minutes; Percentiles; Manual 5/-; Pupil's Non-Consumable booklet 7/6; Cost per test 2½d.

(c) Tests of Attainment in Reading

For a quick estimate of level of skill in word-recognition ("accuracy") three graded-word tests are available by Burt, Vernon and Schonell (in order of date). The Schonell test has the advantage of recency and was standardised in England, but Vernon's (with Scottish norms) provides a pronouncing-key in phonetic script—an asset when testing exceptionally able children who progress to an embarrassingly high point on the scale. Not yet as well known as it deserves is the recent (1958) Southgate which makes available for the first time in this country a group test for assessing accuracy of word-recognition (using a multiple-choice word- and picture-matching technique). This is available in three parallel forms—a great asset in material which normally shows considerable practice-effect. A measure of comprehension as well as word-recognition can be obtained from the very easily-administered Holborn, but where only group testing is practicable the two Schonell tests (R_3 and R_4) are still popular measures of comprehension. The norms have been kept up to date by frequent revision. Some users have been con-

cerned about apparent discrepancies between the scores made by the same child on the two tests. These probably occur chiefly when R₄ is given before R₃. A recent experimental restandardisation provides a conversion table to improve the equality of the two tests (8). When time permits of individual testing the ideal choice is the Neale Analysis of Reading Ability, giving separate measures of speed, accuracy and comprehension. Recent, attractive in appearance, with pictures to assist rapport, exceptionally thoroughly standardised and validated, it is available in three well-matched parallel forms.

15. Graded Word; F. J. Schonell; O and B; 1945; Indiv.; Infant to Secondary; 10 minutes; Reading Age; Manual 1/6; Cost per test 3d.

16. Graded Word; P. E. Vernon; U.L.P.; 1938; Indiv.; Infant to Adult; 10 minutes; Reading Age; Manual 1/-; Cost per test 6d.

17. Burt Re-arranged; C. Burt (and P. E. Vernon); U.L.P.; 1938; Indiv.; Infant to Secondary; 10 minutes; Reading Age; Manual 1/-; Cost per test 6d.

18. Holborn Scale; A. Watts; H; 1948; Indiv.; Infant to Secondary; 15 minutes; Reading Age; Manual 1/6; Cost per test 1½d.

19. Southgate Group; V. Southgate; U.L.P.; 1958; Group; Infant and Junior; 20 minutes; Reading Age; Manual 2/6; Cost per test 4d.

20. Sentence Reading Test 1; A. F. Watts; N.F.E.R.; Group; Junior; 20 minutes; Deviation Quotients; Manual 1/-; Cost per test 2½d.

21. Silent Reading A (R₃); F. J. Schonell; O and B; 1950; Group; Junior; 12 minutes; Reading Age; Manual 1/6; Pupil's Non-Consumable booklet 3d.; Cost per test Nil.

22. Silent Reading B (R₄); F. J. Schonell; O and B; 1950; Group; Junior; 20 minutes; Reading Age; Manual 1/6; Pupil's Non-Consumable booklet 3d.; Cost per test Nil.

23. Neale Analysis; M. D. Neale; MacMillan; 1958; Indiv.; Infant to Secondary; 15 minutes; Reading Age; 3 forms; Manual 1/6; Pupil's Non-Consumable booklet 5/-; Cost per test 5d.

24. Seven Plus Assessment; C. M. Lambert; U.L.P.; 1951; Group; Top-Infant; 75 minutes; Manual 1/-; Cost per test 5d.

(d) *Tests of Attainment in Spelling*

Spelling tests of the dictation type are, of course, non-consumable, and differ from the ordinary class spelling test chiefly in the systematic selection of words and in the availability of norms. The completion

or multiple choice type, which is speedier, less laborious, more realistic, and less accent-vulnerable, has been shown to give equally good results, and would repay further development.

25. Graded Word Spelling; F. J. Schonell; O and B; Group; Junior; 40 minutes; Spelling Age; Manual 1/6; Non-Consumable Test Sheet 3d.; Cost per test Nil.

26. Seven Plus Assessment; C. M. Lambert; U.L.P.; 1951; Group; Top-Infant; 60 minutes; Spelling Age; Manual 1/-; Cost per test 5d.

27. Kelvin Spelling; C. M. Fleming; Gibson; Group; Junior; 30 minutes; Spelling Age; Manual 6d.; Cost per test 4d.

(e) *Diagnostic and Attainment Tests in Arithmetic*

In Arithmetic, a test of mere level of attainment is of limited value because of the variety of sequence and method adopted in different areas and the extent to which attainment, particularly in mechanical computation, is apt to depend on the child's having met precisely that type of computation before. More valuable are diagnostic tests such as those of Schonell, whose more recent tests of more advanced work are not yet so widely-known as his well-established test in the four rules.

28. Essential Mechanical; F. J. Schonell; O and B; 1950; Group; Junior and Secondary; 30 minutes; Arith. Age; Two forms; Manual 1/9; Cost per test 6d.

29. Essential Problem; F. J. Schonell; O and B; 1950; Group; Junior and Secondary; 30 minutes; Arith. Age; Two forms; Manual 1/9; Cost per test 6d.

30. Schonell Diagnostic; F. J. Schonell; O and B; 1950; Group; Junior and Secondary; 75 minutes; Arith. Age; Manual 2/-; Cost per test 8½d.

31. Diagnostic Tests in Money; F. J. Schonell, J. Richardson, K. P. O'Connor; O and B; 1956; Group; Junior and Secondary; 2 hrs.; Arith. Age; Manual 2/6; Cost per test 8½d.

32. Diagnostic Tests in Vulgar Fractions, Decimal Fractions and Percentages; F. J. Schonell, J. Richardson, K. P. O'Connor; O and B; 1956; Group; Junior and Secondary; 2 hrs.; Arith. Age; Manual 2/-; Cost per test 8½d.

33. Staffordshire; M. E. Hebron; H; 1958; Group; Junior and Secondary; 75 minutes; Arith. Age; Manual 3/6; Non-Consumable Test Sheet 1½d.; Cost per test 1½d.

34. Mechanical 2A and 2B; N.F.E.R.; Group; Lower Junior; 30

minutes; Deviation Quotients; Two Forms; Manual 1/-; Cost per test 4½d.

35. Mechanical 1A and 1B; M. E. Highfield; N.F.E.R.; Group; Middle Junior; 30 minutes; Deviation Quotients; Two Forms; Manual 6d.; Cost per test 2½d.

36. Seven Plus Assessment; C. M. Lambert; U.L.P.; 1951; Group; Top-Infant; 90 minutes; Arith. Age; Manual 1/-; Cost per test 5d.

37. Graded Arithmetic-Mathematics; P. E. Vernon; U.L.P.; 1949; Group; Junior to Adult; 30 minutes; Arith.-Maths. Age; Manual 1/6; Cost per test 3d.

(f) *Tests of Attainment in English*

38. Schonell Diagnostic English; F. E. and F. J. Schonell; O and B; 1950; Group; Junior and Secondary; 90 minutes; Attainment ages; Manual 1/9; Cost per test 6d.

39. English Progress Tests A, B, C, D; (A and C) A. F. Watts, (B and D) M. A. Brimer; N.F.E.R.; Group; Junior (A: 8 year olds, B: 9 year olds, C: 10 year olds, D: 11 year olds); 50 minutes each; Deviation Quotients; Each manual 1/-; Cost per test 7d.

6. ADDRESSES OF PUBLISHERS OF TEST MATERIAL

Gibson: Robert Gibson and Sons, 45 Queen Street, Glasgow.
H: George G. Harrap and Co. Ltd., 182 High Holborn, London,
W.C.1.

Lewis: H. K. Lewis and Co., Ltd., P.O. Box 66, 136 Gower Street,
London, W.C.1.

Macmillan: Macmillan and Co. Ltd., St. Martin's Street, London,
W.C.2.

Methuen: Methuen and Co. Ltd., 36 Essex Street, London, W.C.2.
N.F.E.R.: National Foundation for Educational Research in England
and Wales. Tests should be ordered from Newnes Educational
Publishing Co. Ltd., Tower House, Southampton Street, Strand,
London, W.C.2.

O and B: Oliver and Boyd, Tweeddale Court, 14 High Street,
Edinburgh 1.

U.L.P.: University of London Press, Warwick Square, London,
E.C.4.

NOTES AND REFERENCES

1. Buros, Oscar Krisen (ed.), *The Fifth Mental Measurements Yearbook* (Gryphon Press, Highland Park, New Jersey, 1960). See also, for annotated lists of tests, earlier editions of the Buros *Yearbook*, and Vernon, P. E., *Intelligence and Attainment Tests* (University of London Press, 1960). Vernon, P. E., *The Measurement of Abilities* (2nd edition, University of London Press, 1956).
2. For advocacy of the use of tests, see for example, Ballard, P. B., *The New Examiner* (University of London Press, 1923) or Vernon, P. E., op. cit., 1960.
3. Neale, Marie D., *The Neale Analysis of Reading Ability* (Macmillan, London, 1958), manual p. 3.
4. See, for example, McClelland, W., *Selection for Secondary Education* (University of London Press, 1945) or Vernon, P. E. (ed.), *Secondary School Selection* (Methuen, 1957).
5. See, for example, Crane, A. R., "An Historical and Critical Account of the Accomplishment Quotient Idea", *Brit. J. Ed. Psychol.* XXIX (1959) pp. 252-260.
6. Mager, B. B., *Tweeddale IQ Conversion Tables*, (Oliver and Boyd, 1950), 1s. 9d.
7. A recent investigation showed that when the Terman-Merrill test was given by experienced teachers who had taken an advanced diploma course in psychology (D.C.P., Birmingham) and been specially trained in the administration of this test, the errors of measurement were no greater than when the test was given by fully qualified psychologists. See Curr, W. and Gourlay, N., "Differences between testers in Terman-Merrill testing", *Brit. J. Stat. Psychol.* IX (1956), pp. 75-81. The examination of problem children would of course normally call for a psychologist's diagnostic intuition as well as skill in obtaining the intelligence quotients.
8. Curr, W., and Gourlay, N., "The Effect of Practice in Performance on Scholastic Tests", *Brit. J. Ed. Psychol.* XXX (1960), Table 2, p. 166.

THE DEVELOPMENT OF THE CHILD'S CONCEPTION OF NUMBER

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1. INTRODUCTION

IN recent years there has been considerable improvement in the methods of teaching reading, but very little improvement has taken place in arithmetic teaching. Today, in most schools, reading materials are suited to children's interest, ability and maturational level. This is far less common in arithmetic because we have not progressed so far in our knowledge about children's learning difficulties in arithmetic (1, 2, 3). We are now on the threshold of a change towards greater emphasis upon meaning, understanding and insight. Field psychologies (4), of which the Gestalt theory is probably the most familiar to teachers, stress the organisation of learning into experiences in which the learner takes an active, constructive and critical part, so that he may discover basic concepts, unite them into a system of ideas, and develop the ability to visualise and imagine. When ideas are related and seen as meaningful wholes, insightful or meaningful learning takes place. Subject matter and teaching method in arithmetic should be so planned that each learning experience follows naturally upon preceding learning experiences. Each new idea should be presented as an orderly extension of something the pupil already knows and understands. The teacher helps the child to structure ideas and to symbolise them so as to develop understanding of the number system and number relations.

(1) *The Informal Approach*

Primitive man was "surrounded by abundant sensory experience with concrete objects" for thousands of years without acquiring a number system. The Hindu-Arabic notation, expressing all numbers by means of nine symbols and a place holder, was a major accomplishment of human endeavour, and yet this profound and important idea seems so simple to us now that we ignore its significance. The greatness of the achievement may be appreciated when we remember

that the Greek mathematicians did not discover it. Even in this country it is not yet five centuries old. "The earliest example of the use of the Hindu-Arabic system in Britain is said to be the rent roll of the St. Andrew's chapter in 1490" (5). A modern civilised child is not brought up as in a primitive community. We do not deny him food or warmth until he himself finds the need for them. We do not deprive him of the knowledge accumulated by a mature society. Yet in teaching by "incidental methods" the child is introduced to number through a series of "life situations" in the hope that they may motivate his thinking about number. The "life situations" usually deal with isolated fragments drawn from the whole world of number, and processes are not repeated often enough to ensure understanding and thorough learning of the number system. In his experience alone, a child will never meet all the number situations called for in later life, and his own need for number knowledge is not alone adequate to develop arithmetical skills; the "situation" may become an end in itself and the arithmetic remain superficial and of secondary importance.

In contrast, formal methods of teaching treat arithmetic as an organised and sequential subject systematically presented. By this method, many children learn a mass of dictated, prescribed, isolated and unrelated number "facts"; processes are often unrelated to children's experiences outside the classroom. The method was greatly influenced by the behaviourist schools of psychology (3) and, in particular, by Thorndike's "connectionist" theory of learning and his laws of "frequency, recency and intensity" (6). Skills were acquired through constant drill, rules and dictated procedures; "computational efficiency was almost the sole criterion of arithmetical ability, and number thinking was mainly in terms of separate combinations and operations" (7).

(2) *The Meaning of Arithmetic*

The aim of arithmetic teaching should be to create interest in arithmetic *for its own sake*, and to develop quantitative thinking. Arithmetic is the means of expressing the quantitative procedures in social situations and it is almost as essential as verbal language to the progress of mankind. Whatever method is used, there is no escape from the necessity of learning number processes and relationships. The function of practice should be to increase efficiency of performance in operations which are already clearly understood, to emphasise the systematic character of the number relations and the

number system, and to reinforce the meanings that are learned in other parts of the arithmetic programme. All number meaning should be made clear through initial concrete teaching. But the physical activity with concrete materials, rods, blocks, pegs, counters, beads, shells, etc., must be accompanied by mental activity and "verbalisation" (8) which result in clarification of meanings, and organisation of experiences in wholes which make sense to the learner. "The use of many and varied pieces of apparatus may cause confusion in the mind of the child and a lack of unity in his conception of number" (9). Swenson (10) writes: "Enough research studies (11, 12, 13) have been done on the comparative results of different methods of arithmetic instruction, in the primary grades, to support the statement that methods which lead the children themselves to discover relationships and note generalizations, yield superior learning results."

(3) *The Idea of Conservation*

Piaget's researches into the child's conception of number (14), have demonstrated the need for re-thinking our methods of teaching and the design of teaching apparatus. He analysed children's number thinking by observing their reactions to a series of simple number situations and by asking questions about their responses. Piaget found that when an ordinary 4-5-year-old child is required to "pair" related objects, e.g. to buy one sweet for one penny, he may err in one-to-one matching. Or, when the sweets and pennies are placed in rows and matched, he may say that the two sets are the same, but when the pennies are spaced out while he is watching so that they form a longer line than the sweets, he may say there are more pennies than sweets. If the pennies are collected up into a heap he may reverse his decision and say there are more sweets than pennies. (14, Ch. 3) "For an adult, a row of n spaced-out elements keeps its cardinal value n if its length is diminished by closing up the elements. It is appreciation of the relation between the length of the row and the intervals between the elements—the 'additive seriation of the two relationships' (14, p. 90)—that establishes conservation of the group value". Piaget concludes that "the importance given to the procedure of one-for-one exchange in which so many authors have attempted to see the beginnings of cardination, is unjustified, since this procedure does not in itself result in the notion of necessary equivalence of exchanged sets" (14, p. 61). It is clearly impossible for

a child to understand addition and subtraction until he understands the principle of conservation.

(4) *Equivalence and Equality*

A $4\frac{1}{2}$ -6-year-old does not generally understand that two equal quantities of liquid, or sand, in identical containers remain equal when one of them is poured into a container, or containers, of different size or shape. He is satisfied that "two quantities of liquid are equal if the two levels are the same irrespective of the width of the containers" (14, p. 15).

Suppose a young child is presented with a set of counters arranged (i) in random order; (ii) in parallel rows; (iii) in a geometrical form which does not depend on the exact number of counters used, e.g. a circle, a right angle; (iv) in a geometrical shape which does depend upon the exact number of counters used, e.g. a square, a cross; (v) in complex geometrical forms, e.g. a rhombus. If the child is asked to "pick out the same number" without suggesting any method, he will attempt to reproduce the *shape* of the figure without regard to the *number* of objects used (14, p. 65). "Closed figures depending on a given number of elements are well produced, because they involve a 'good' configuration, but collections, rows, open figures, and even closed figures with an arbitrary number of elements, are not correctly copied. Linear series, in particular, are evaluated by their total length only, irrespective of their density" (14, p. 87). "In order to make his own figure correspond to the model, the child must of course take into account simultaneously dimensions, density, shape, etc." (14, p. 88). In the first stage of number thinking, an ordinary $4\frac{1}{2}$ -5-year-old reacts to the *total* space or area occupied and his criterion of evaluation is in terms of "bigger", "smaller", "longer", "more", "less", etc., rather than in terms of co-ordinated relationships of dimension, density and shape. He sees the whole shape without being able to decompose and analyse its parts.

At the second, intuitive stage, an ordinary child of $5\frac{1}{2}$ - $6\frac{1}{2}$ co-ordinates these relationships, and he can match a set of objects with another set arranged in any configuration, but he is still uncertain about the constancy of the number of elements composing the sets if the configuration of one set is changed.

(5) *The Logical Stage*

At the third stage a child discovers the "constancy of number" (14, p. 92). He understands that a number or a quantity remains un-

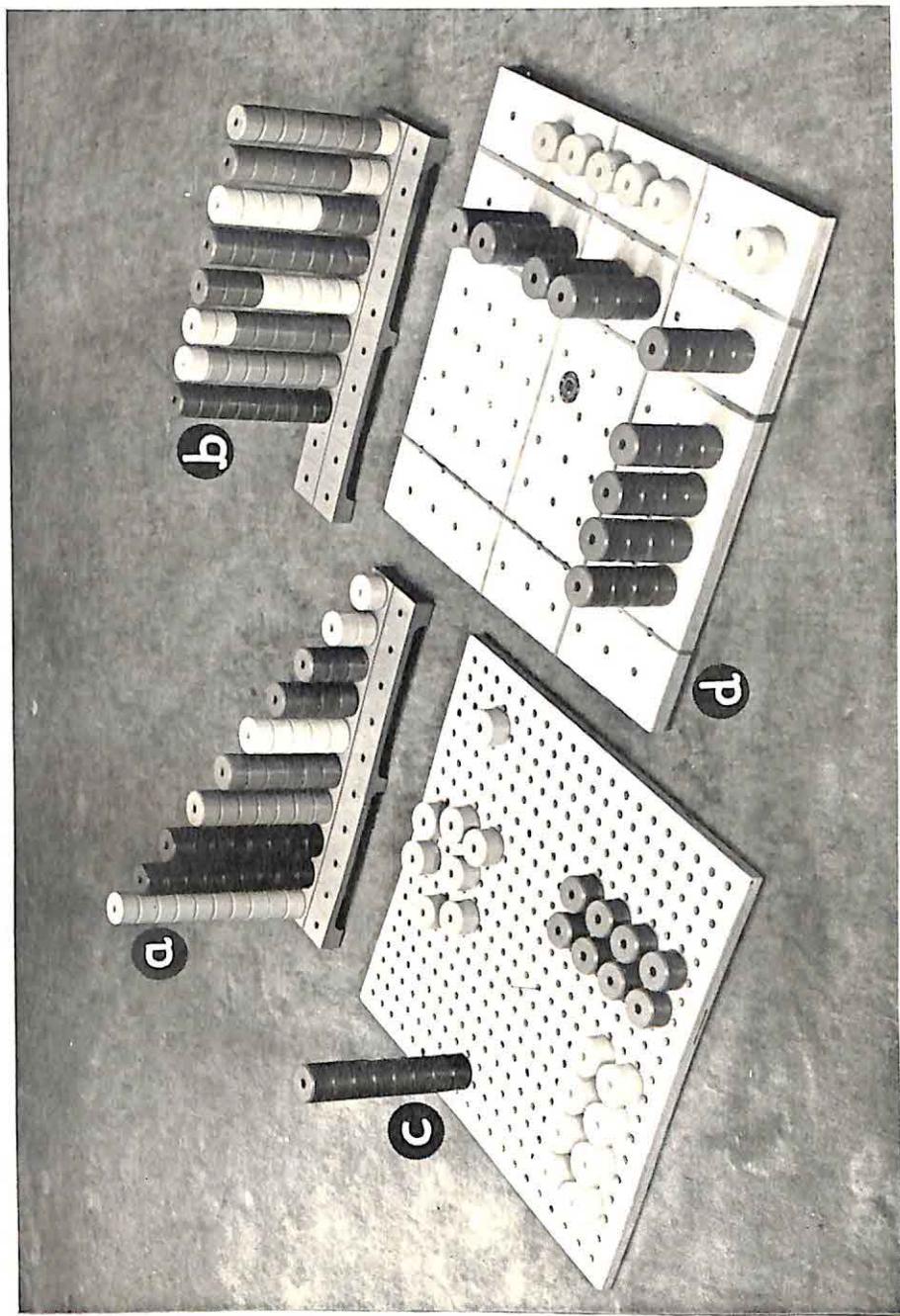
changed irrespective of the distribution of its parts, and that the parts are additive, subtractive, multiplicative, divisible and reversible. He is able to see that the qualitative asymmetrical differences between height and width, element and space, etc., of one quantity or set, equal the differences of another quantity or set. When a child matches a set of red counters with a set of blue counters arranged in a complex figure, he has to understand that he is dealing with *counters* irrespective of their colour. He unites symmetrical relationships (blue and red counters) to form the class, counters. He equates the length and density differences in each set by additive seriation, but in order to construct one set having exactly the same length and the same intervals as another, he must additively seriate the relationships twice. Piaget calls this the "logical multiplication of relationships" (14, pp. 90-91). "The construction of number, however, consists in the equating of differences, i.e. in uniting in a single operation the class and the asymmetrical relationship" (14, p. 95). The order in which the counters are placed does not alter the number of counters used. The concept of number is the understanding of the composition of a group of objects irrespective of their size, shape, colour, kind, arrangement or re-arrangement. The objects themselves do not furnish the concept of number. It develops through the experiences with which a child meets number situations.

2. THE "STRUCTA" APPARATUS

The writer believes that his own method, developed at the Remedial Education Centre, Burton-upon-Trent, and now used in a number of schools, successfully applies Piaget's findings to the teaching of number. The understanding of number relationships and concepts may be accelerated by the systematic study of structured number groups by means of this specially designed apparatus.¹ Acceleration of learning does not mean forcing children beyond their maturational and intellectual development; this, as Williams (15) points out out "may result in overt manifestations of emotional stress". If a teacher believes that children are lacking in "number readiness" she should create an environment to give the children the necessary action-experiences to develop "readiness" rather than wait passively for it to develop. The writer's apparatus, which provides this action-experience consists of:

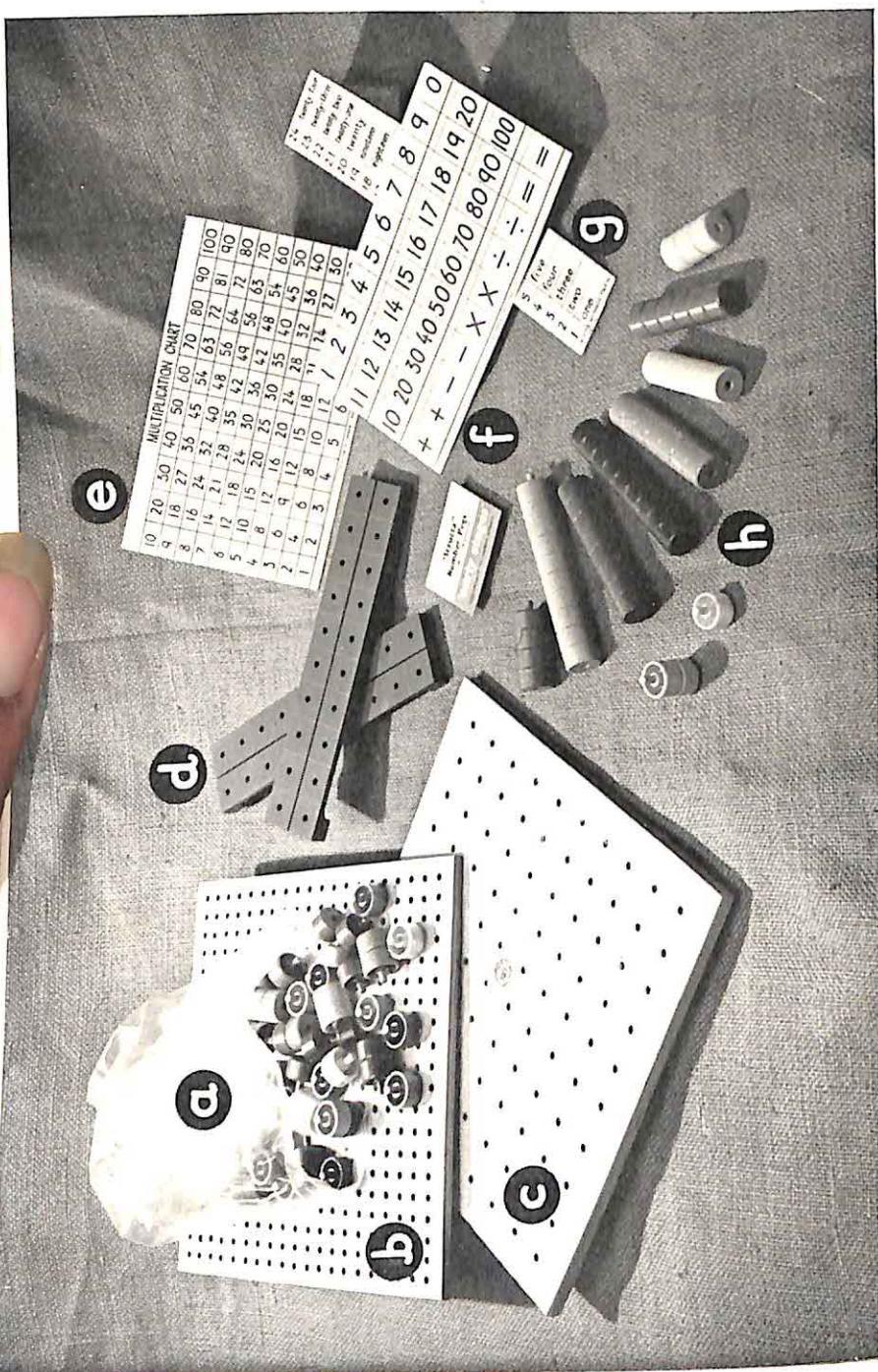
(i) Cylindrical number pegs, in twelve bright colours. The pegs

¹ The "Structa" Number Material; published by James Galt and Co., Ltd., Cheadle, Cheshire.



11. Composition of "diamonds" material. (a) number stair. (b) composition of the number "eight".

1. "STRUCTA" material: (a) number-pegs; (b) 100-board; (c) 100-board; (d) 20-board; (e) multiplication-card; (f) symbol-cards (for cutting); (g) 24-card; (h) number-rods (1 to 10).



fit into number peg boards but they also fit into each other to form vertical rods. Inverted pegs may be used as counters without the use of peg boards.

(ii) Number rods varying in length from one to ten pegs. The rods represent the numbers 1 to 10.

(iii) 20-bases, in two colours, light and dark blue, marked into two rows of ten square inches each, with a hole in the centre of each square. There is a central slot along the length of the base for holding various cards.

(iv) Two square peg-boards, one with 400 equally spaced holes and the other with 100 equally spaced holes. On the former, the distance between the holes is slightly less than half the diameter of the number peg so that the pegs cannot fit into successive holes, but only into alternate holes. This enables the child to offset pegs in successive rows, if he desires, to make a wide variety of patterns.

(v) A series of charts printed on card. Each chart is divided into columns each equal to the width of a number peg and into rows each equal to the height of a peg.

(a) A card marked as a 100 chart on one side and a multiplication chart on the other.

(b) A card marked into columns of Tens and Units on one side and Shillings and Pence on the other.

(c) A 24-card marked with the numerals 1 to 24 and the corresponding number names.

(vi) Numeral cards 1 to 10, 11 to 20, and 10 to 100 with the numeral on one side and the number name on the reverse side.

(vii) Sets of notation cards, 1 to 9, 10 to 90, and 100 to 900. The "tens" cards are twice as long, and the "hundreds" cards are three times as long, as the "units" cards. The cards are used to symbolise the notation of numbers 1 to 999.

The 20-base has many uses:

(i) As a storage base for two sets of number rods 1 to 10.

(ii) As a counting board for number pegs or for any discrete objects less than one-inch in cross section, e.g. acorns, buttons, counters, shells, etc.

(iii) As a base for seriating number rods; for matching one group of objects with another; for arranging pegs in Montessori patterns; for teaching odd and even numbers; for grouping rods into families of numbers, etc.

The 20-bases may also be placed side by side or end to end to form square peg-boards or long counting-lines. By placing charts into the slot of the base, it may be converted into a 'Tens and Units frame; a counting frame for numbers to 100; a multiplication and division frame; a fraction and decimal frame, etc. When the base is in use, the row of holes further away from the child is referred to as row 1, and the other row as row 2.

Piaget discovered that children vary in their ability to seriate graded rods, and many have difficulty in keeping the bases of the rods level (14 p. 124). The 20-base eliminates this difficulty, while the number-rods eliminate density differences between groups of pegs. Similarly the equally spaced holes of the peg boards and the 20-base limit density differences between sets of objects.

The reader may like to test his own methods of perception. Look at this group of dots.



How many are there? How did you find the answer? Did you count them singly? Did you see the group as a whole? Did you split the group into sub-groups and add them together?

Modern man with all his knowledge of number can perceive only six or seven objects at a glance in a group of randomly scattered units. He may see ten or more as a group by mentally grouping those that make a "good configuration" and adding the remaining units, but groups above ten involve either greater attention to sub-groups or direct counting. The grouping of objects into small equal sub-groups involves counting *whole groups* by the same names that are used to count *objects*. Graded number rods enable a child to "see" and use groups of up to ten units.

Counting demands attention to an object at the time when the corresponding number name is spoken. This relationship between number names and objects is an early example of one-to-one correspondence. Verbalisation of the number names does not necessarily mean that a child understands counting. A five-year-old may be able to count by rote but unable to apply one-to-one correspondence to more than four or six objects.

3. THE USE OF "STRUCTA" APPARATUS

(1) *The Numbers 1 to 5*

In the "Structa" scheme, the numbers 1 to 5 are taught first. A peg is placed in the first hole of row 2 of the 20-base. The child talks about his experience of "one"; one sun, one moon, one nose, one tongue, etc. The peg is moved to row 1 and a plain card is placed in the slot of the base to hide the peg. Two pegs are placed in line in row 2, and the child relates his experience of "two"; two eyes, two legs, etc. The teacher points to the second peg and says, "One", and then she inserts the first peg into the second peg and says, "Two". This process is repeated. The two-peg rod thus made is removed from the base and the teacher holds it up and says, "Two". She removes the card from the base, points to the one-peg and says, "One", places the two-peg rod in the second hole of row 1 and says, "Two". She points to each group in turn and says, "One. two". This procedure is repeated for the numbers to five, and, later, to ten. The child compares his own vertically structured pegs with sets of pegs permanently structured into rods and so learns the numerical value of each number rod.

Thereafter, he can use the number rods as whole numbers, quickly and easily, as reference material to verify the value of any group or configuration of number pegs. For example, some pegs are arranged in varied patterns on the 400-board and then collected into a vertical group. The height of the group is the number and the pupil compares this height with a number rod to check his knowledge of the group. Thus he learns that a number remains constant *irrespective of the manner in which the elements composing the number are distributed*. The grouping and re-grouping of concrete objects in many and varied forms, rather than in the same "domino" pattern each time, is a real arithmetical learning situation. The understanding thus acquired is a pre-requisite for later understanding of necessary abstractions and for dissociation of the fundamental numerical idea of "threeness" etc. from the concrete material.

The children collect pictures and make books of the numbers 1 to 10 for the number table. Number is related to everyday experiences—e.g. collections of objects on the nature table are labelled and numbered. Many games are played until the child is able to enumerate to ten with one-to-one correspondence and to produce the appropriate set of pegs or objects when any number name up to ten is given. He knows that the last named peg or object is the name of

the group (cardinal value) and he learns the position of each number in the series (ordinal value).

(2) *The Number Symbols*

The recognition and writing of number symbols is taught by the kinaesthetic method, tracing numerals in the air or on a slightly roughened surface with the index finger of the dominant hand, and tracing and copying digits on duplicated sheets. Numeral cards 1 to 10 which fit into the base are matched with rods 1 to 10. (A black line at the bottom of each card ensures the correct placement of the card in the base.) At a later stage, the child learns to read the number names on the reverse of the numeral cards. Poor orientation in number writing is, in many cases, due to bad teaching. The writer observed a child in an infant school tracing round cut-out templates of numerals and colouring the shapes. Three out of six shapes were reversed or upside-down! Apparatus which can be so misused is poorly designed.

(3) *Number Families*

A number-rod (the "six", say) is placed in the first hole of the 20-base. A 1-rod is placed in the next hole and then the complement, a 5-rod, on top of it. A 2-rod is placed in the third hole and again the complement, a 4-rod, on the 2-rod. This is continued until the whole of the six-family is built up in the 20-base, viz. $6, 5+1, 4+2, 3+3, 2+4, 1+5$. The child knows immediately if the rods are correctly placed because each pair will be level with the first, or family, rod. Addition is thus shown not as a process of "getting more" but of "putting things together". When a child places a 2-rod on to a 4-rod to obtain six, he learns that $4+2=6$, and $2+4=6$. Subtraction is not a process of "getting less". It is a process of "taking apart". By taking apart the 2-rod and 4-rod the child sees that there are six altogether, but two taken from six, are four, and four from six, are two. Thus insight is gained into the law of commutation: the order of the addends may be changed without changing the total. In this way the family of any rod can be built up (the numbers above ten requiring more than one rod in the first hole).

Numeral cards and sign cards are fitted into the slot of the base to show number processes in symbolic form. The child records number-families on squared paper. Many games are played with the pegs, peg-boards, rods, numeral cards, notation cards and sets of self-checking material. Classbooks give practice in sums in column, equation and written form, and plenty of oral and written practice.

in the various verbal statements relating to addition and subtraction is given until complete mastery of the number combinations to 10 is attained *without counting*.

(4) *The Meaning of 10*

A Tens and Units chart is fitted into a 20-base. The child is given ten pegs to build up in the units' column; he sees that only nine pegs fit in. The difference in magnitude between one ten and one unit is emphasised. In all early number work, he uses rods in the tens place, which are ten times as big as a unit. By placing two or three bases end to end, rods can be serialised to form a stairway from 1 to 30, in which the rods 1 to 9 are repeated in each decade, standing literally on a "base" of ten. The stairway can be used to demonstrate the constancy of the unit by placing a single number peg on each rod in turn from 1 to 30. This shows that the difference between any two adjacent rods is one, and that any rod "n" has an $n-1$ rod before it and an $n+1$ rod after it.

(5) *The Higher Decades*

A 100-chart is placed in the slot of a 20-base. By placing a number rod in each hole in turn and filling the spaces to the left with ten-rods, the child sees that the numbers 1 to 9 are repeated in each decade e.g. 9, 19, 29, 39, 49, etc. By building up five two-rods in each hole in turn, he counts in twos and sees the numbers 2, 4, 6, 8, 0 repeated in each decade. By building up two five-rods in each hole, he counts in fives and sees that the numbers 5 and 0 are repeated in each decade. By moving two rods totalling less than ten (e.g. a three-rod and a four-rod) through the decades, he relates $3+4$ with $13+4$, $23+4$, $33+4$, etc. When he reaches the last decade, the reverse procedure takes place and he subtracts through the decades, $97-4$, $87-4$, $77-4$, etc. In a similar manner he learns to add tens to tens and units, and to subtract tens from tens and units.

Higher decade addition is an extension of simple addition, and it is best introduced by "addings by endings". $8+8=16$ is a basic number fact; $18+8=26$ is adding by endings involving bridging the tens into a higher decade. $8+8=16$ is a key number fact which runs through the different decades. Thus $28+8$ will be seen in relation to $8+8$, $18+8$. The child discovers this relationship by adding an eight-rod to an eight-rod through the decades of the 100-chart. He will also discover that each basic combination has eight

¹ In the number combination $a+b=c$ when neither a nor b is greater than 9, the number combination is said to be a basic number fact.

higher decade subtractions associated with it, e.g. $16 - 9$ is linked with $26 - 9$, $36 - 9$, $46 - 9$, etc.

(6) *Addition and Subtraction of Tens and Units*

A Tens and Units chart is placed in a base. A second base is placed in front of the first base so that there are three rows of holes in front of the chart. In the first row immediately in front of the chart, are placed ten-rods and unit-rods representing the first addend, and in the second row are placed rods representing the second addend. The rods are added together and the sum is placed in the third row. The process is set out beside the Tens and Units frame with notation cards, and the child then records the process on paper. When the sum of the units is greater than nine, he finds a ten-rod and a unit-rod to equal the sum and then he places the unit-rod in the Units' column and carries the ten-rod to the Tens column. He includes this ten in the addition of the tens.

Subtraction of tens and units, with or without carrying, is demonstrated by placing rods representing the minuend in the first row, the subtrahend in the second row, and the difference in the third row. Any method of subtraction, equal addition, decomposition or complementary addition, may be demonstrated equally well.

(7) *Money and Measurement*

The value of coins is taught with real money, and coins to one shilling are related to number rods, a ten-rod and a two-rod being used to make a shilling-rod. A Tens and Units frame is transformed into a Shillings and Pence frame by replacing the Tens and Units card with a Shillings and Pence card. The addition and subtraction of shillings and pence, with or without carrying, are demonstrated on the Shillings and Pence frame and by means of notation cards at the side of the frame. Self-contained shops with the prices and articles arranged in graded order of difficulty are used on class desks to practise number processes applied to money, not to teach them. The shops are flannel-covered boards and the "goods" are labels and pictures pasted on to flocked rayon. The priced goods and work cards pack away into a labelled box.

The unit number peg is exactly half-an-inch long. 2-rods and number pegs fit together to make rulers for measuring length. Yard sticks, and a trundle wheel with a circumference of one yard are used to measure longer distances. A large pair of callipers is used for measuring cylindrical or similarly shaped objects.

(8) Multiplication and Division

Educational research has shown that multiplication and division combinations differ in order of difficulty (16, 17, 18) and there is general agreement that facts such as 3×7 and 7×3 are not identical operations for a child. He experiences greater difficulty when the second term is larger than the first; and the larger the multiplier and the multiplicand, the harder the number fact becomes. The study of tables wastes much time and effort; there are many more repetitions of the earlier and easier facts than of the later and harder facts. There is economy of teaching, greater understanding and greater accuracy in performance if the paired system of teaching is used: $5 \times 3, 15$; $3 \times 5, 15$; $15 \div 3, 5$; $15 \div 5, 3$. In the "Structa" scheme the tables method has been replaced by six groups of multiplication and division facts in progressive order of difficulty. The first group consists of the multiplication and division facts using 1 and 2. The second group consists of the facts $3 \times 3, 3 \times 4, 3 \times 5, 4 \times 4, 4 \times 5, 5 \times 5$, and their reversals and division facts. Each group is known as a family and for each family there are a combination card and self-checking question-cards. The Twelve-Family combination card has the numbers 2, 12, 6, printed diagonally across it. Two pink cards each contain one multiplication fact of the family, $2 \times 6, 6 \times 2$, with answers on the reverse, and two green cards contain the division facts, $12 \div 2, 12 \div 6$, and answers.

The multiplication and division combinations containing 2 are related to the doubles learned in addition and subtraction, e.g. $5 + 5, 6 + 6$, etc. Multiplication Charts are put into two bases. Other bases are placed end-to-end to form a Counting Line and a single base is placed in front of the child. The teacher picks up two six-rods, and says, "Instead of saying, 'Six add six, twelve', we can say, 'Two sixes, twelve'. This way of using numbers is called multiplication, and this sign, 'X' means 'to multiply'." The two six-rods are fitted together, and placed in the first hole of the single base. The child is then asked, "How many two-rods equal twelve?" He builds up six two-rods in the second hole. A ten-rod and a two-rod are built up in the third hole and the child sees that the three groups of pegs are equivalent. The two six-rods are then taken apart and transferred to the first two holes of a multiplication frame, where the top of the second rod coincides with the product, 12, on the chart. The two-rods are then taken apart and transferred to the first six holes of the other multiplication frame so that the top of the last two-

rod coincides with 12 on the chart. The multiplication cards are now matched with the corresponding set of rods, 6×2 with the two six-rods, and 2×6 with the six two-rods, showing that the first term is the name of the group represented by the rod, and the second term is the number of times that it is multiplied.

Division is demonstrated on the Counting Line. Twelve unit-pegs are placed in each row of the Counting Line. The teacher asks, "How many sixes are there in twelve?" The child builds up the pegs into groups of six. He builds the other set of twelve pegs into groups of two and sees that there are six twos in twelve. He matches the division self-checking cards to the groups.

As an alternative approach, two equal groups of unit-pegs are set out on the 100-board or the 400-board. E.g. two groups of 24 are each set out in four rows of six pegs. In one group, the pegs in the rows are then built up into six-rods, and in the other group, each column is built up into a four-rod, thus showing that 24 contains four sixes, or six fours.

(9) *Uneven Division*

How many twos are there in seventeen? This problem is solved in two ways; (a) seventeen pegs are set out in the Counting Line, and then built up in twos, making eight twos and one peg remaining; (b) a ten-rod and a seven-rod are built up in one hole of a base and in the next hole two-rods are built up to show that eight two-rods and a one-rod equal seventeen.

(10) *Fractions and Decimals*

Any rod may be used as a unitary whole. If an eight-rod is one whole, what is a four-rod? What is a two-rod? What is a one-rod? What is a nine-rod? If a ten-rod is one whole, what decimal part of it is a one-rod? If ten ten-rods is a whole, what decimal part is a ten-rod and a one-rod?

4. CONCLUSION

This scheme may be considered very rigid, but actually is not so. At each stage the child applies his knowledge as widely as possible by means of assignment and work cards. The work cards are self-corrective so that the teacher can concentrate on the task of *teaching*. Children will not cheat in an environment of acceptance, sympathy and approval where they have no fear of getting sums wrong. Arithmetic, to be enjoyable, must be taught in a situation free from tension, group competition and comparison. The scheme here described

enables a child to compete with himself, or with a partner of equal ability. He has the opportunity of seeing his own progress and has incentives to improve his own scores. Bright children can forge ahead; duller children can master skills at their own rate and there is no loss in knowledge due to absence from school.

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NUMBER WORK FOR JUNIORS IN AMERICA, BRITAIN AND RUSSIA

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A CONSIDERABLE part of junior school work in Britain is traditionally taken up by mathematics. Except where conscious efforts have been made to break away from tradition, the bulk of junior mathematics has been composed of arithmetic. The extent of the ground covered by this aspect has, in the past, been determined by factors other than the natural interest of children in number and spatial concepts and relations, or their immediate needs *as children* for computational techniques. A study of other nations' practice is of interest insofar as it shows possible alternative aspects of mathematics suitable for youngsters. Comparisons made here are between syllabuses of the U.K. the U.S.A. and the U.S.S.R.

In comparing syllabuses of different countries, consideration must be given of the organisation of education in the countries concerned. In both the U.K. and the U.S.A., education is locally directed. The State (not Federal) Authority decides broadly what will be taught in American schools, the L.E.A. in ours. This generalisation gives by no means a complete picture however. In our schools, at least, the only legally compulsory subject is Religious Education and, theoretically, the head teacher can decide what other instruction takes place. In practice, a number of pressures will cause a head to follow an established pattern in at least the mathematics field. In the U.S.S.R., the junior school syllabus is issued centrally by the Federal Ministry of Education and applies equally to all schools in the Union.

It is impossible to outline a syllabus for British schools which can be said to apply to them all. An analysis of a score of syllabuses obtained at random from schools in London and the Home Counties shows a remarkably high degree of similarity among them, and in most respects they are sufficiently like the old Standards syllabus issued by the Board of Education at the turn of the century to be regarded as still under its influence. It may not be far wrong to say that in many British schools, the number syllabus for juniors has

hardly changed in sixty years. There are reasons for this which cannot be pursued here. It is sufficient to note that the content of mathematical work provided for children is historically rather than psychologically determined.

The role of the syllabus in the school is almost a paradoxical one. It may be the last thing one of Her Majesty's Inspectors would require from a head teacher, yet it is the first thing a class teacher asks for on joining a staff. When outlined in detail it may not be closely followed by the teacher unless examination pressure is brought to bear on his work. Whilst there may be considerable differences of opinion about the need for a detailed syllabus, however, the teacher does expect something in the nature of a scheme of work for the school to follow.

The overwhelming impression given by an examination of the syllabuses from the U.K., the U.S.A. (1) and the U.S.S.R. (2) is that in all three countries, junior children are expected to cover almost identical ground in number work. The first topics in common are as follows: numeration up to a 1,000,000 and beyond; the 4 rules applied to numbers, weights and measures; long division and multiplication using up to 3 figure divisors and multipliers; the 4 rules in fractions and decimals and various tables. These are followed by geometrical experience covering the simple properties of squares, oblongs, circles and triangles; areas of plane figures, volumes of cubic shapes; time computation from seconds to centuries (and in the U.S. syllabus, Zonal time); relationships involved in ratio and proportion; and averages. Finally, children in all countries are expected to be able to apply the above techniques to problems involving as many as 3 steps.

There are, however, important differences in the syllabuses and these, perhaps, are more significant than the similarities. The preamble to the Russian syllabus lays down that: "About half the time devoted to Arithmetic both during lessons and homework must be used to teach the children to solve problems"; also, "A great deal of time must be spent on mental calculation. During the first two years, pupils do their calculations only orally." This stress on oral work is not obvious either in the U.K. or U.S.A. syllabuses examined. Since the Russian child starts compulsory school at about 7 years, perhaps the early junior syllabus is more appropriately seen in relationship to our infant work, which is also oral in bias.

The Russian syllabus differs again from the others in its emphasis upon practical aids in number work. It requires that: "Visual aids,

practical work and instruments must be widely employed in the primary classes; the children make their own measuring instruments, abacus, geometrical shapes and solids, as well as those provided by the school. The making of models also develops the children's ability to use simple tools and to be neat fingered". The abacus is mentioned freely and in the 3rd and 4th year (i.e. for children of 9 to 11) it is laid down that children use it for adding and subtracting. At first sight this may seem odd, especially when we think of our traditional bead frame. The abacus proper, however, cannot be compared to this rather misleading toy. Both in Russia and Japan, the abacus is used by adults for lengthy and speedy computation. As an aid to teaching place value, it is most valuable. Our own schools might reintroduce it with advantage.

Another interesting feature of the Russian syllabus is its omission of all money calculations. This can only be explained by assuming that the metric system renders it as simple to work in money as in ordinary numbers. The only Russian money table is "100 kopecs equal 1 rouble". The Americans, with as simple a coinage, do however give syllabus time to monetary calculations. The Russian syllabus also omits mention of graphs and percentages despite the important part they play in Russian everyday life.

The two important items which differentiate the American syllabus from the others are, first, the inclusion of the study of the meaning of words in problems, reminding us that children need to understand the language of mathematics as well as the mechanics of it; and second, some time in the 4th year, the study of the history of numbers up to the Hindu-Arabic stage of development.

In view of the present-day ferment in the field of junior mathematics, we might find more than passing interest in other peoples' ideas to help illuminate the way forward.

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THE FURTHER EDUCATION OF THE YOUNG WORKER

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THE publication of the Government White Paper—*Better Opportunities in Technical Education* (1)—following fairly soon after the report (2) of the Central Advisory Council 15 to 18 provides a suitable occasion for a discussion of the problems involved in the further education of those who leave school between 15 and 16 years of age—problems which lie in what the report called “neglected educational territory”.

The causes of this neglect lie deep in our cultural history. Ambivalence about the education of the masses has shown itself throughout the whole history of such education and is much in evidence in the attempts—never, so far, whole-hearted—to expand or improve it by means of the local technical college.

The confusion in our philosophy of education is also evident in current discussions about increased provision for higher education at university level, but that is not my province. I am dealing here with the impact of this confusion on the young people of 15 and over, some of whom reject academic studies, regard leaving school and starting work as a liberation, and “see no point” in “education”. Many of these find employment in enlightened firms or take on jobs where further education is regarded by the particular industry as essential, and thus find themselves attending a local or area college (3) on one day per week, but for the rest—a much greater number—formal education is indeed over.

The changes taking place, not only in production methods, but in the nature of the products themselves, are leading to a situation, already familiar in the armed forces, in which an uneducated workman is a liability. The army can to some extent select its recruits, rejecting if necessary the mentally as well as the physically unsuitable. With full employment and a shortage of manpower the problem for the community at large and for industry in particular becomes the

much more difficult and expensive one of raising the educational level of something like half the population.

Each nation devises its own educational policies and the English way of dispensing further education to those who are not among the intellectual élite is certainly unique. It is not every English educationist who attempts to follow its ramifications, and foreigners, however avid for information, are frequently dismayed and defeated.

However, though the details of the work of Establishments of Further Education may be complex, it is reasonably simple to disentangle three or four interrelated strands which have determined the course of their development.

The growth of elementary schooling during the nineteenth century led on the one hand to an appreciation of the value of education with a consequent demand on the part of the working classes for its continuance into adulthood, and on the other to a parallel demand for the rudiments of education by those who had been deprived of it in childhood.

Making good past deficiencies and providing a second chance are still a feature of the work of local technical colleges, and though the details alter, the need for such provision arises generally from similar causes. Some who regret missing education in a selective secondary school can still find a chance to retrieve part of the loss in G.C.E. and other courses within technical and commercial colleges, and those who for economic and social reasons left school as soon as possible, can continue to learn, if they wish, in their own free time.

A third and dominant factor has been the demand of expanding and changing industry for better trained and better informed work people. It is this aspect more than any other which has been the cause of the neglect of technical education by those concerned with other and more traditional forms of education, for reasons which are part of the philosophical confusion to which we have already referred. At the one extreme are the "liberal" educators who consider that learning should be its own reward and deplore any suggestion of usefulness, and at the other those who support the argument used by Forster in 1870 (4) and by the Minister of Education to-day (5), that it is upon the increased provision of education that our industrial prosperity depends. The former are not prepared even to use the word "education" for what the latter have in mind, and so, despite understanding support from such eminent educationists as Thomas Henry Huxley (6) and A. N. Whitehead (7) and psychological analyses in terms of "meaningful goals" and learning theory, a "liberal"

education is still to some extent set apart in our thinking from other—presumably illiberal—forms which more often than not are considered “mere technical training”.

The famous mathematician G. H. Hardy (8) boasted in his autobiography that none of his research results could be considered remotely “useful”. Soddy’s comment in reviewing the book (9), was “from such cloisteral clowning the world sickens”. In his *Aims of Education* Whitehead has argued that “the antithesis between a technical and a liberal education is fallacious. There can be no adequate technical education which is not liberal, and no liberal education which is not technical: that is, no education which does not impart both technique and intellectual vision. In simple language, education should turn out the pupil with something he knows well and something he can do well. This intimate union of practice and theory aids both. The intellect does not work best in a vacuum. The stimulation of creative impulse requires, especially in the case of a child, a quick transition to practice. Geometry and mechanics, followed by workshop practice, gain that reality without which mathematics is verbiage.”

Fortunately for Britain, though divergence of opinion about vocational motives is still with us, it has not prevented the expansion of university education on vocational lines for the intellectually superior. To the original “liberal” subjects considered necessary for the education of theologians and gentlemen have been added, not without controversy, all the subjects necessary to produce doctors, dentists, lawyers, teachers, social workers and even engineers and managers.

Unhappily, a further argument (our fourth strand), rarely explicit, but none the less potent, has prevented the development, on any adequate scale, of such a common-sense compromise for the mass of the population. This argument maintains that “real” education is only possible with certain classes of people and that for the rest vocational training to become useful workers is the most that is possible. Such a contention is essentially anti-democratic and can be used to justify wide divergence in the quantity and quality of educational provision for different classes of people. For, once it is admitted that maximum educational development is essential for everyone then it may be argued rationally that the poorer the intellect the longer must be the period of tutelage. The only evidence of such reasoning which we have at present is the higher leaving age of 16 for the educationally sub-normal.

In dealing with this topic in his recent book *The Long Revolution*, Raymond Williams (10) sees the problem as a clash between the "public educators" who, as democrats, considered that "men had a natural human right to be educated"; the "industrial trainers" who wished to "promote education in terms of training and disciplining the poor as workers and citizens", and thirdly the "old humanists" who were often "deeply opposed to democracy . . . and argued that man's spiritual health depended on a special kind of education . . . variously described as 'liberal', 'humane' or 'cultural'." The argument is still unfinished and in Williams' view still overshadowed by "class thinking". He quotes Vernon's work on the effects of intellectual stimulation beyond the school leaving age (11) and argues that we must "get rid of conscious or unconscious class thinking and begin considering educational organisation in terms of keeping the learning process going, for as long as possible, in every life".

Keeping in mind this network of aims and ideas which have produced our present system of further education it becomes easier to grasp the significance of the great variety of classes and courses catalogued in the prospectus of any local or area college. Because of the stress we place on academic freedom it is possible for judgements about the value of further education carried on in Local Education Authority institutions to be prejudiced. The number and range of courses of a cultural and recreational nature which are available in the evenings is not sufficiently appreciated, nor is it widely realised that colleges are empowered to arrange classes in a wide range of subjects at the request of a sufficient number of prospective students.

In addition to classes such as these, which are mostly held in the evenings, the prospectus will also list many vocational classes which are attended by students—frequently over 21—who are unable to attend in the day time. In 1958/59 1,632,072 evening students attended classes in local technical colleges and evening institutes (12).

Day time courses are either full time or part time. Full time students are a growing minority, and their courses can be of two kinds. As already mentioned, most local colleges, following their tradition of providing a second chance for the unsuccessful or underprivileged, run day time classes in G.C.E. subjects at both the Ordinary and Advanced levels. There is a wide range in the age of these students, and they come from all types of schools from residential public to secondary modern day. Many pupils who fail at school, qualify in this way for entry to universities or some form of professional education.

Some full time day classes are also arranged for apprentices and other workers. The initiative for these can come from the college, with students recruited from any interested firms, or they can be arranged by the college at the instigation of one or more firms. In each case the object is the same—to broaden the education given to apprentices and help them to attain qualifications more quickly and efficiently than is possible part-time. Such classes are growing, but the rate of growth probably satisfies no-one.

This brings us to a consideration of the vast bulk of day time classes, and in particular to those for National Certificates, City and Guilds and other courses with which the White Paper is concerned. The City and Guilds of London Institute was founded in 1879 and had nearly 30,000 candidates per annum before the first World War, and in 1959 there were over 138,000. National Certificate examinations began to be introduced in 1921 to provide a higher qualification for part-time students, and the realisation in war-time of the immense shortage of skilled workers ensured a great increase in the numbers taking these examinations and an extensive development of part-time day release. In the session 1937/38 about 41,000 students aged 15 to 21 and over were in attendance at local technical colleges on one day per week. This figure grew sevenfold to about 300,000 by 1952/53, and by 1958/59 it was 438,369. The numbers of young people in the age group increased during those years after the war, so that there are still only about 17 per cent of young people aged 15-17 being allowed day release. The outlook is rosier if boys only are considered since day release for girls is very small indeed, but even so, there is no room for complacency.

Opinions on the need to educate work people vary between industries and between trade unions. Attitudes are naturally influenced by the structure of a particular industry and its need for skilled personnel, though the picture is by no means rational and clear cut. The proportion is highest for the engineering industry, with over 50 per cent of employees under 18 years of age attending part-time day classes; mining, building, and public administration and defence come next with 35-48 per cent released, and at the bottom of the scale come agriculture and insurance and banking with less than 1 per cent.

It is only within the last ten years that the effectiveness of this form of education has been examined, with somewhat depressing results. Over 70 per cent of all students in part-time O.N.C. courses and nearly half of those in City and Guilds classes are engineering apprentices, and the investigations have been almost entirely con-

fined to these groups (13). The great attraction of the National Certificate course is that it has provided a route to professional status as an engineer, and over half the Associate members of the Institution of Mechanical Engineers, which has a membership of over 40,000, have achieved their qualification (A.M.I.Mech.E) in this way.

The first stage consists of the Ordinary Certificate which is a three year part-time course comprising (for Mechanical Engineering) Mathematics, English, Engineering Science, Engineering Drawing, Applied Mechanics and Workshop Technology. Volume II of the Crowther Committee Report, 15 to 18, contains the results of a survey of such courses which confirms the high rate of failure and wastage which had been found in follow-up studies within individual colleges (14). Eleven per cent of those who take the first year examination succeed in obtaining a certificate in three years, and after five, six or more years not more than 25 per cent qualify.

The second stage in this route to professional status is the Higher National Certificate. This is a two year course, but investigation shows that very few students do in fact succeed in the two examinations in the minimum time of five years when studying only one day per week: of those who obtain the Higher National Certificate at least half take more than two years for the second stage.

Having achieved a Higher National Certificate in engineering, further examinations (in, for example, Industrial Administration) which are known as endorsement subjects, are necessary before the student is accepted for graduate membership. Practical experience over a number of years at a sufficiently responsible level will later entitle him to apply for Associate membership.

In 1959, 13,838 students succeeded in gaining an Ordinary National Certificate. Using the results obtained by the Crowther Survey it can be estimated that about another 36,000 had started the course but had failed to obtain a certificate. The failure and wastage indicated by these figures has led to much discussion on the causes and speculation about possible remedies (15).

The White Paper, *Better Opportunities in Technical Education*, contains proposals which the Minister hopes will help to achieve four main objectives—"First, they are intended to broaden the education received by students and to provide the maximum continuity between education at school and technical college. Secondly, they will adapt the system more closely to the needs of industry, and in particular meet the urgent need to make more and better provision for technicians. Thirdly, they will increase the variety of courses

available to students according to their aptitudes and the careers they wish to follow. Fourthly, they should substantially reduce the wastage which occurs at present owing to the failure of so many students to complete their courses successfully."

To achieve these aims there are ten proposals which can be considered under three heads:

(1) *No gap between school and college; more time for study, especially in the day time, and improved teaching methods*

Since apprenticeships usually start at 16, there is frequently a gap between leaving school at 15 and starting a technical college course. Employers do not always grant day release to 15-year-olds, and those who wish to take preliminary courses in order to be able to join National Certificate and other classes later often have to attend an evening institute several evenings per week. Many technical colleges already run preliminary courses in the day time, but the Minister is now recommending that all such courses should be held during the day and not in evening institutes at all, so that the student begins to attend a college immediately after leaving school.

Also recommended are more full-time and sandwich courses; an extension of part-time day release to 330 hours per annum instead of the present 220 to 280; and the introduction of tutorial methods of teaching.

All these recommendations, if implemented, will cost money. If full-time or sandwich courses were to be made available to all school leavers, it would involve a vast re-organisation of the local technical colleges. Many more buildings would be needed and a large increase in the teaching force, including, for every college, men and women more interested in people than subjects and capable of dealing in new ways with the whole range of general and social studies.

(2) *Re-arrangements of existing courses and the addition of new ones*

In future there are to be five main types of courses, some the same as before, some modifications of existing ones, and some new.

(i) *National Certificate and Diploma courses* as at present, for students to become at least high grade technicians. It will still be possible for students successful on these courses to proceed to professional qualifications. The main change here is that the Ordinary National Certificate will be a two year instead of a three year course, the first year being considered a qualifying year. (At present students with certain qualifications such as G.C.E. in four subjects including

Mathematics, English and a Science can obtain exemption from the first year.) The principal effect of this will be that the decision whether to take a National Certificate or a more practical City and Guilds Technicians course will be postponed for a year.

(ii) *Technician courses* to be devised specifically for particular industries. Only two such courses exist at present—for Electrical and Telecommunication Technicians—and this is perhaps the most important proposal contained in the White Paper. In the past, large numbers of students have attempted the National Certificate examinations without wishing to proceed to Associate membership or to take on a job above the level of a technician. Many of them, finding that these courses do not meet their immediate vocational needs, lack the ambition or interest to undertake the academic study they demand. It is presumed that it is this group which is the cause of the high failure rate.

(iii) *Craft courses*. These already exist in large numbers and are examined by the City and Guilds of London Institute. The extra time proposed is to be used for more English and general studies and some broadening of the treatment of the technical subjects.

(iv) *Courses for operatives*. These are intended for the 66 per cent of boys and 93 per cent of girls who start work without entering upon any apprenticeship or learnership in skilled occupations. It is recognised in the White Paper that large numbers of these do not need any specifically technical or vocational education, but "would be better fitted for industrial life if they were able to take suitable courses of a more general character" (16). Very few of these young people are at present allowed to attend college during their working time.

(v) *General courses*. This is a new proposal. Preliminary courses intended to prepare school leavers for technical college courses already exist, and the syllabuses for the new general courses will presumably be similar. They will extend over two years. The first year course will lead directly to the first year of the new Technicians' courses, and it is probable that some students who would now attempt an Ordinary National Certificate will at this point opt for these. The second year of the general course will lead to the two year O.N.C. course, so will have to cover similar ground to the present first year of the Ordinary National Certificate. Those who do not do well enough to proceed by this route will be able to enter the second year of a technician's course.

The aim is to produce a syllabus which will allow students to

proceed either to an academic course or to a more practical one according to their performance. It is clear, however, that they will need to reach the standard of the G.C.E. in Mathematics and Science if the ex-secondary modern school boy is to compete fairly with the direct entrant into the Ordinary National Certificate course. How far it will be possible to do this and at the same time provide suitable preparatory work for the potential technician remains to be seen. It is probable that with more G.C.E. courses in modern schools fewer and fewer will go into the National Certificate courses from preliminary (or general) courses at technical colleges.

(3) *Better Selection*

The main changes in the organisation of technical college courses which are proposed in the White Paper are the introduction of Technician courses of a lower academic standing than the National Certificate, and the re-organising of the preliminary courses into a two year "General" course which will be used for selection either to the National Certificate or to an appropriate Technicians' course. The intention is to reduce wastage and failure by taking "more care" in the selection of students for the various alternatives, and it is assumed (a) that these changes will raise the standard of entry to National Certificate courses, and (b) that raising the standard of entry will decrease the failure rates. It is doubtful whether either of these assumptions is justified.

The Crowther Survey showed that pupils who qualify for exemption from the first year of the course by success in G.C.E. or other examinations at school did not fare outstandingly better in Ordinary National Certificate courses than those who left school without any qualifications. Of the former, 49 per cent eventually gain a Certificate, and the figure for those without exemption is 43 per cent, if the first year of the course is regarded as a diagnostic year (17). It has also been shown that many of high ability as measured by intelligence and attainment tests fail, and that the students themselves recognise that the incentive to study is frequently lacking (13).

Direct observation by teachers and personnel officers confirms the findings of such research. These suggest that the key to any fundamental change in the failure and wastage rates is the question of motivation, and to improve this will involve an examination of our attitude to the further education of those who start work at 15 or 16.

In industries where education is considered important, where employers allow their young workers time for full-time study or

where the rate for the job is dependent upon obtaining the appropriate certificate, both staff and students are keen; pass rates are often very much above average and wastage is negligible. At the other extreme are large numbers of workers learning a skilled trade within an industry where there are few incentives to study, where wage and promotion policy is unrelated to academic success and where, therefore, only individuals with personal motives for succeeding are likely to have the necessary interest to do so.

This then is the dilemma. Are we content to go on as we are, altering and amending a little here and there, leaving the onus on the intelligent individuals to make the effort to educate themselves away from their own social environment? Or do we believe that in an industrialised and civilised democracy further education to the limit of their potentialities is essential for everyone; because in the first place man has a "natural human right to be educated"; because in an industrial society further education is also vocationally necessary; and thirdly because no democratic society can remain healthy without some form of universal "liberal" or "cultural" education? The three reasons are not conflicting but complementary.

In conclusion, it is interesting to look at this matter from the point of view of a society which has approached the problem of education from an entirely different angle. In 1960 the Americans had about 80 per cent of their young people in full time education up to the age of 17 (18). In the effort to make education equally available to all, they have minimised individual differences, often to the detriment of their superior intellects (19). It seems, however, that they are now concerned with a similar problem to the one we have found in considering English students in technical college classes.

In a book recently published in America (20), *Excellence: Can we be equal and excellent too?*, Dr John Gardner, the President of the Carnegie Foundation, discusses the problem of motivation in a society which makes it easy for everyone to obtain higher education. They have, he says, in their colleges large numbers of boys and girls who really "couldn't care less" about higher education, but are there because it's the thing to do. ". . . we are just beginning to understand the extent to which motivation is socially determined", and ". . . our difficulty is that we shall get more or less precisely what we deserve."

This is equally true on this side of the Atlantic. In our case a much higher percentage of young people start work at 15 or 16 and

their subsequent further education is largely geared to industry and paid for by industry. We have to ask in the first place, whether this is the only kind of further education they need, and if we are agreed that it should be broadened and extended to include all young people up to 18 years of age, is it feasible to expect industry to go on paying for it?

The research results can be interpreted in two ways. Echoing the White Paper we can say that "the high failure rate at present is evidence of the need to revise the requirements for entry into National Certificate courses. Neither full time education up to 16 nor the satisfactory completion of a preliminary course has proved a reliable indication of a student's suitability for an Ordinary National Certificate course with its high academic standard." Or, we might consider that a situation, where 38 per cent of ex-secondary modern school pupils who gained no qualification at school succeed, and 44 per cent of those who enter after success in G.C.E. courses in grammar schools fail (17), requires something more fundamental than slight alterations in the selection procedures. Recognising that able people are failing on these courses, it could be argued that the need is to tackle the reasons for failure. It is possible to reduce the failure by allowing, or even persuading, able students to be content with an easier option. To question whether this is the best solution raises issues with implications beyond the confines of the Ministry of Education. In Dr Gardner's words, "As a society, we shall have only the kinds of talent we nourish, only the kinds of talent we want and expect. *Are we nourishing the kind of talent that will create a great civilisation or are we not?* In matters relating to talent and society that is not just another question. It is The Question."

NOTES AND REFERENCES

1. *Better Opportunities in Technical Education* (H.M.S.O., 1961.)
2. Central Advisory Council for Education (England). (Chairman—Sir Geoffrey Crowther.) 2 Vols. 1959 and 1960. Often referred to as the Crowther Report.
3. Since the publication of the White Paper on *Technical Education* by H.M.S.O. in 1956, the Technical Colleges of England and Wales, numbering just under 500, have been re-organised into four groups:
 1. Local colleges of further education—about 300.
 2. Area colleges with a wider catchment of students and some higher courses—about 150 to 160.
 3. Regional colleges—All types of courses including some advanced work—23 to 30.

4. Colleges of Advanced Technology—Advanced courses only, at university level—8 to 10.
See also *Technical Education* by P. F. R. Venables (Bell and Sons, 1956), and for a short statement by the same author *British Technical Education*—a pamphlet published for the British Council by Longmans Green.
4. Forster, William Edward, Vice President of the Committee of the Privy Council on Education, in justification for the Education Act of 1870 pleaded that "upon the speedy provision of elementary education depends our industrial prosperity". Quoted by Williams (10), but see also Adamson, *English Education*, Chapter 13.
5. Sir David Eccles, Minister of Education, in a speech at Luton in February, 1961, said that "education is a powerful factor in industrial growth" and commended Russia for putting its "red shirts on education". He made it plain that he considered the short sighted attitudes of some industrialists to be outmoded, and, from the national point of view, disastrous. Reported in "Education", 17th February, 1961.
6. Huxley, Thomas Henry. "Technical Education" Collected Essays. (Especially No. 17).
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8. Hardy, G. H., F.R.S., *A Mathematician's Apology* (1941). Various "Uses" for his research results have since been demonstrated, but it is only fair to him to add that mathematicians consider that his work in pure mathematics put the subject back on the map. The tendency since Newton had been to regard it as an ancillary to physics. In his book *A Course of Pure Mathematics*, published in 1908, he put the point of view of "pure" and "liberal" education very forcefully, and when revising it in 1938 he reflected that if he were to re-write it, it would no longer be necessary to write like "a missionary talking to cannibals".
9. Soddy, Frederick. *A Mathematician's Apology* reviewed under the title "Qui s'accuse s'accorde" *Nature*. Vol. 147, p. 3. 1941.
10. Williams, Raymond, *The Long Revolution* (Chatto and Windus, 1961), pp. 141 and 142.
11. Vernon, Philip E. "Recent Trends in Mental Measurement and Statistical Analysis." Lecture to the London Institute of Education. Published under the title *The Bearings of Recent Advances in Psychology on Educational Problems* by Evans Bros., London. "After 11, in Britain, we do get bigger divergences in environmental stimulation. Children are now at an age when they should be acquiring complex concepts and modes of thought, and the different kinds of schooling provided in Grammar, Modern and other schools, together with the intellectual levels of their homes, may well affect their growth. At 15, the majority leave school and enter jobs which do little to exercise their "brains", and their leisure pursuits are mostly non-stimulating. But a privileged minority continue to receive intellectual stimulation to 17, 18, 21 or later and are more likely to enter jobs where they use

their minds, and to indulge in cultural leisure-time pursuits. Hence, we would expect, as has been clearly proved, that education during the teens does affect the ultimate adult intelligence level. The man with full secondary and University education has on the average a 12 I.Q. point advantage over the man who was equally intelligent at 15 but has had no further education since then."

12. *Education in 1959*, Ministry of Education Report (H.M.S.O., 1960)
13. Venables, Ethel C. 2 papers in the *British Journal of Educational Psychology*. Vol. XXX, 1960, pp. 237-43., and Vol. XXI, 1961, pp. 56-68.
14. Three surveys were carried out by the Crowther Committee and detailed results are reported in Volume II. One of these, the Technical Courses Survey, obtained the results of a sample of students from 114 colleges, and estimated the number of years taken to complete the various courses. Pass rates of students were analysed according to social background and previous schooling and attainment.
15. Articles and Correspondence in *Technology* since 1957. See also *Vocational Aspect* and *Technical Education*.
16. The vocational motive to justify expenditure on further education for this type of student is still very much in evidence. Within the colleges it is too seldom questioned and those who have to plead for such obvious amenities as gymnasiums, playing fields, student union activities etc., sometimes take pains to justify them on the grounds of their usefulness and desirability for training "leaders", or "managers" or "co-operative workmates".
17. The figures for engineering students in Ordinary National Certificate courses given in Table I, p. 214 of Vol. II of the Crowther Report read as follows: (Pass rates at each stage have been added)

Students with no exemption			Students exempt from first stage		
N = 4,757			N = 1,100		
STAGE			STAGE		
	S.1	S.2	S.3	S.2	S.3
Enter	100	59	39	100	64
Qualify	67	43	25	76	49
(Per cent pass	67%	73%	64%)	(76%	76%)

From this it is easy to assume that those who have taken G.C.E. and other courses are twice as successful as those who have not.

If, however, we regard S.1 as a preliminary stage and consider that the 59 per cent who proceeded to S.2 are selected for, and starting, a new course with a new name, the results would appear as follows:

Preliminary Students	Students qualifying for O.N.C. by success in Preliminary examination			Students qualifying for O.N.C. by success in G.C.E.s and other school examination		
	Enter	100	100	66	100	64
Qualify	67		73	42	76	49
		73%		64%	76%	76%

Further analysis of these figures shows that the grammar school entrant with G.C.E. successes has the maximum pass rate of 56 per cent and the ex-modern school boy with no previous examination success has a rate of 38 per cent.

18. "New Frontiers in Education", *The Economist*, 25th February 1961.
19. Dr Gardner (see 20, p. 112) quotes as "the underlying philosophy" of American schooling a statement by a teacher, Marietta Johnson, in *Youth in a World of Men* that "any school system in which one child may fail while another succeeds is unjust, undemocratic and un-educational".
20. Gardner, John W., *Excellence: Can we be Equal and Excellent too?* (Harper, New York, 1961). Particularly the chapter on "Motivation" pp. 93 and 101.

THE INFLUENCE OF A BOY'S HOME BACKGROUND ON HIS LEVEL OF PERFORMANCE IN GAMES AT A GRAMMAR SCHOOL

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1. INTRODUCTION

THE social background from which a child is drawn appears to markedly influence his development and values. The influence of certain features of his background has been noted in relation to moral judgments (6, 9, 12), attitude to sport (1, 11, 14) and respect for authority (7, 10). It seems reasonable to assume that the effect of this social background should also be evident in an individual's attitude towards, and subsequent performance at games. Work on the national level (1) appears to indicate that this might be true. With children of equal physical ability the actual level of games performance attained will depend on the attitudes they develop towards games. Whereas a child's attitude towards games is a complex feature to measure, his performance at games is much easier to assess and hence an attempt was made in this study to measure the effects of the child's background on his games performance. This latter measure could possibly be taken as a composite of innate physical skill and the desire to do well at games because of the attitude developed in the boy by his social surroundings.

2. METHOD

There have been tests constructed to estimate the skills of children in soccer (3, 15). It might have been possible to construct a test to measure the skills of children, but it was felt that the validity of this estimate in relationship to the game situation might have been difficult to establish. In selecting "games performance" as the criterion, it was possible to have a more direct method of establishing a games scale. A stratified sample was drawn from a large English grammar school. At that school two winter games were played and there was a sufficient enrolment to have a school team in both games

for each year of entry. The boys of each year were placed in six streams according to their academic attainment and on the games afternoon these streams competed against one another. It was possible for a boy to play for his stream at both winter games but because of the fixture arrangements, only possible for him to represent the school at one of the games. Thus a scale of performance could be set up. In this scale it was arbitrarily decided to weight the performance of the boy who played for the school team and the scale of performance used was that as in Table I below.

TABLE I
GAMES PERFORMANCE SCALE

- Does not play for stream at either game.
- 1 Plays for stream at one game.
- 2 Plays for stream at both games.
- 4 Plays for school, and for stream at one game.
- 5 Plays for school, and for stream at both games.

A criterion for the social level of the home area was sought and the one selected was that of the percentage of jurors in the voting population of the electoral locality in which the boy lived. For the purpose of this criterion it was assumed that each electoral locality was homogeneous. As the necessity for ownership of property over a fixed rateable value was a factor in selection for juror duty, it was considered that this would have given an indication of the percentage of property owners in the area. It was then assumed that the higher the juror percentage the higher the social level of the area. The juror percentage varied from 0-4% and thus the areas were grouped in five intervals over this range.

The initial school contact of the grammar school boy has been that of his primary school. The attitudes and facilities that he had met at this first seat of learning were thought factors that might have influenced him for the future. The assessment of the primary school which the boys in the sample had attended was made by the Senior Organiser of Physical Education for the area. He classified the schools, eighty-seven in number, into three grades according to their overall physical education provision. The actual facilities of the school for physical education, the attitude in the school towards the subject and whether or not the school had a trained physical education specialist were all taken into account in making the assessment. With his fairly intimate knowledge of all the schools in

his area it was thought that the assessment submitted could be taken as fairly accurate.

It has been shown (12) that the values a child attaches to a particular code of behaviour correlate highly with those of the parent, and also that these values are formed in the preschool period (6). Such evidence would indicate that the influence of the father should be considerable in forming the attitude of the boy towards games and thereby the standard of games performance reached by the boy. It was decided to obtain an overall picture of the father which would include both his games ability (possibly a genetical factor) and his interest.

The boy was asked to what level on a given games scale his father had played. The scale appearing as Table II was suggested but without the marks.

TABLE II

SCALE OF FATHER'S GAMES PARTICIPATION

- o Didn't play at school or boy didn't know
- 1 Played at school.
- 2 Played for school.
- 3 Played after leaving school.

By obtaining this information from the child it was assumed that the answers would be coloured by the parental interest. An uninterested parent would infrequently mention his prowess and the child would tend to underrate it. An interested parent would demonstrate his interest frequently and the child would tend to exaggerate in recounting his father's performance. What was sought was the impact on the boy of his father's participation in games. It seemed likely that a measure of this impact might be forthcoming from enquiries of this nature.

3. RESULTS AND DISCUSSIONS

When the games performance of the boy was correlated with that of his father the value of Pearson's r obtained was $+0.65$. The data was then grouped as in Table III for Chi Square investigation.

Chi Square results from this table had a probability of less than $.001$. It would appear from these results that the relationship between the games performance of the boy and the participation of his father was a highly significant one. It was higher than that obtained for certain factors, e.g. intelligence (8), that are said to be largely inherited. Thus this relationship might have been contributed

TABLE III
CONTINGENCY TABLE FOR GAMES PERFORMANCE
OF THE BOY AND HIS FATHER

		<i>Father</i>		
		<i>Good (3 & 2)</i>	<i>Poor (1 & 0)</i>	
Boy	School Player	44	9	53
	Rest	44	83	127
		88	92	180

to by the inherited factors as postulated by Bailey (2) and Pilley (13), and the motivation obtained from the interest displayed in the home environment (2, 4).

The data for the study on the relationship between the boy's games performance and the Physical Education facilities of the primary school that he attended was grouped as in Table IV below.

TABLE IV
CONTINGENCY TABLE FOR GAMES PERFORMANCE AND PHYSICAL
EDUCATION FACILITIES OF PRIMARY SCHOOLS

		<i>Primary School</i>			
		<i>Good</i>	<i>Satisfactory</i>	<i>Poor</i>	
School Player	School Player	16	27	10	53
	Non School Player	24	57	46	127
		40	84	56	180

This gave a Chi Square value of 6.06 which was barely significant at the 5% level (5.991 required). Regrouping the data into a two-by-two table, the schools were classified as good or average/poor. Chi Square for this distribution did not reach the 5% significance level. Regrouping into a second two-by-two table, this time classifying the schools good/average or poor, gave a Chi Square value with a significance of between .05 and .02, i.e. statistically significant. Thus it would appear that there was a significant trend for the school players at the grammar school to have come from primary schools with good or average facilities for physical education. This would agree with Steel's work (16) in the field of physical skills. However, the trend was only a broad one and the degree of performance at games did not closely follow the facilities in which the

boys had been brought up. Thus these facilities, though useful, were not absolutely essential, a viewpoint held by Bradman (5). It was interesting to note that the division for significance was at the level of the schools with poor facilities. There was a significant trend for the poorer games performers to have come from the primary schools with poorest physical education facilities. The stimulation of "good" facilities did not appear to significantly improve the performance above that achieved by boys who were used to "average" facilities. From this it would seem that it would be better to see every school adequately equipped prior to munificently equipping any, i.e. the idea of the show piece might be very wasteful. The effect of the facilities became less apparent once these facilities exceeded the level of adequacy. What this level was though, has yet to be assessed.

The data for the study of social area and performance was correlated and a value for Pearson's r of $+0.05$ was obtained. This was an insignificant correlation. A Chi Square calculation was carried out on the data grouped as in Table V below.

TABLE V
CONTINGENCY TABLE FOR GAMES PERFORMANCE AND SOCIAL LEVEL
OF HOME AREA AS ASSESSED BY THE JUROR COUNT

		Home Area		
		40-21%	20-1%	
School Player	19	34	53	
	51	76	127	
		70	110	180

A probability of between $.7\cdot5$ was obtained for this grouping of the data. Thus there did not appear to be a significant relationship between the games performance of the boys and the social level of their homes as assessed by the criterion of juror percentage.

In attempting to find a method of delineating home areas, a correlation between the postal district of a boy's home and his games performance was made and this was insignificant, as could be expected. However, in the frequency table it was noted that boys who came from a certain geographical area of the city had poor games performances. Thus the area, which comprised three consecutive postal numbers, was compared with the rest of the city and the frequency table is given in Table VI below.

TABLE VI

GEOGRAPHICAL LOCATION OF A BOY'S HOME AND HIS GAMES PERFORMANCE

	Home Area in Postal Districts		Rest
	8, 9, 10	Rest	
School Players	3	50	53
Rest	22	105	127
	25	155	180

This gave a Chi Square figure of 4.25 which had a probability of between .05-.02. This was a statistically significant result. In seeking an explanation for this relationship two possible factors emerged. Firstly was the fact that certain parts of this area were condemned as slums. A juror count showed these slum areas as socially poor areas, but this could hardly be taken as the reason, as earlier it appeared that social level on this criterion was not related to games performance. Also other parts of this area would score highly on the juror count and thus tended to balance the overall social level of this larger area. The second possibility was that it was recognised as a predominantly Jewish area, and this ideological factor might have been influential in this study. To check this the sample was divided into Jewish and non-Jewish factions and compared on the basis of games performance. The frequency table is given below as Table VII.

TABLE VII

FREQUENCY TABLE OF JEW AND NON-JEW ON THE BASIS
OF GAMES PERFORMANCE

	Jew	Others	180
	Non Stream Players	Others	
Others	6	116	122
Non Stream Players	17	41	58
	23	167	180

This gave a Chi Square figure of 20.99 which had a probability of less than .001.

Thus it would appear that the social level of the boy's home area on the criterion used in this study was not significantly related to the boy's performance at games. Evidently the motivation found by Richards (14) with the coloured American athletes was not present to such a marked degree in this sample. That motivation does improve games performance has been demonstrated by Waters (17).

It could be that the social deprivation was not sufficiently severe to produce the effect Richards (11) postulates—namely that of achieving position in society through games when such position is denied on social attainments.

The significant relationship between poor games performance and homes situated within a certain geographical area of the city might have been related to the ideological background of the boys from that area. Why this trend should have existed is difficult to understand. Perhaps the devout holding of a Saturday as the sabbath would remove the final incentive of playing for the school on the Saturday. However, the division was made at the level of the non-stream player, i.e. the nonparticipant, and there appeared to be a significant relationship between this lowest level of games performance and this particular ideology. Perhaps the two games played did not appeal to boys of this group. If this were true then it would be interesting to know the reason for this social trait.

4. SUMMARY

Of the factors studied with this particular sample, certain of them appeared to be significantly related to the games performance of the boy at the grammar school.

The influence of the father, as assessed by the son's expressed knowledge of his father's games participation, appeared to have a considerable effect on the level to which the boy played games at the grammar school. It appeared that in this matter of physical performance the influence of the home background was profound. The attitudes within the home appeared to play a much greater part in determining the boy's games performance than did the social level of the area in which the home was located. However, note must be taken of the criteria used for assessing the social level and that any conclusions made should be within the limits of the criteria used. However, the geographical locality of the home did appear to have some bearing on the boy's games performance and it appeared that this bearing might have been caused by ideological rather than geographical reasons. Why this particular ideology appeared to have, in this sample at least, boys of low games performance was not evident. Closely associated with the home area was the primary school attended before the grammar school. There an interesting effect appeared to emerge, that of the tendency of the boys of lower games performance at the grammar school to come from primary schools assessed as poor for facilities for physical education. This

was a significant tendency whereas good facilities at primary school did not produce boys with higher games performance at grammar school than did primary schools with just average facilities for physical education. It might be that poor facilities had a greater stultifying effect than good facilities had a stimulating effect on the boy, and as a result it might be better to provide adequate facilities for physical education at all primary schools before richly endowing any one of them.

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IRREGULAR ATTENDANCE IN A GRAMMAR SCHOOL FIRST FORM

by F. SANDON

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IN Mr Rankin's interesting article in this journal (1) he calls attention *inter alia* to four points:

(a) There are few attendance problems in the junior school. But L.E.A.s are concerned about the poor attendance records in secondary schools. He asks if it is reasonable to assume that as soon as children pass from the junior to secondary school, certain children should be stricken by ill-health.

(b) Usually the attendance of junior pupils is consistent throughout the age and academic groups.

(c) Usually the children with the poorest school attendance records are the least able academically (cf. 2).

(d) In one L.E.A., of the proceedings instituted in respect of irregular attendance, 42% of the total number of cases related to children in their final school year and of these, two-thirds of the summonses concerned girls (cf. 3).

In this connexion certain data that the writer has available may throw some light. They are based on records taken from the attendance registers for five consecutive years of a two-form-entry grammar school. They cover, therefore, some 300 children who were in their first year and thus relate to nine terms. For each term the total number of absences per pupil was recorded. As, however, there was no consistent practice about recording an absence for a whole term (or even for the greater part of a term) the frequency tables, of pupils for each particular number of absences, were taken over the range of 0 to 20 only. The frequency was pronouncedly reversed J-shaped: there was, in fact, one case only at the frequency of 20. The proportion of cases of no absences at all in a term was: Form 1A Boys .60; Girls .52. Form 1B Boys .55; Girls .46 (4). The following table summarises the results for sessions absent per term:

Group	IA Boys	IA Girls	IB Boys	IB Girls	Boys	Girls
Number of Records Reviewed	203	227	228	176	430	404
Mean Number of Absences per Term Combined	2.08	2.21	2.32	2.85	2.20	2.48
	IA	2.15	IB	2.55	Form I	2.34

It will be seen that the absences per term increase as we read across the table over the various groups within the forms. If we test the differences between the average values, we find that the sex difference is significant only for Form IB, that the form difference is significant only for the girls. The girls of Form IB are very significantly ($P \ll .001$) worse in their attendance than are any of the other three groups.

Form I data has been taken to illustrate the problem for two reasons: first, the pupils concerned have only just been transferred from the junior schools; secondly, any possibility of excess absence due to effects of puberty on the girls is negligible. The conclusion appears to be that the poorer attendance of the less academically able girls is very evident as soon as they transfer from the junior school. It would be interesting to have data, therefore, for the junior schools to check Mr Rankin's second point above. Do the less academically able girls in the junior school (those in the lower streams) already have a poorer record of absence than their abler sisters or their brothers?

It would also be interesting to check the estimate (1) of 5% of children absent from school on account of ill-health necessitating medical care. What is the cause of the excess of the (100—92.5%) absence of the junior pupils over this 5%? For the grammar school quoted above the absences stated to be due to sickness (whether supported by a medical certificate or not) were about 5%; this is also the approximate figure for the school concerned in Sandon, 1961. These 5% accounted for practically all the absences, since with small schools the personal details are much better known and non-sickness more easily recognised. In other words, the difference found above in the first form is probably due to an excess sickness rate among these less academically able girls. Can Mr Rankine deal with this point as applied also the junior schools?

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REFLECTIONS ON "HISTORY THE BETRAYER"

A Review Article

by R. SZRETER

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M R DANCE has written a very worthwhile book (1) on a problem that cannot but exercise at times all honest and thoughtful history teachers. The question of bias in the teaching of history—particularly in school textbooks—has so far received inadequate attention, and it is a reflection of this state of affairs that unpublished materials loom so large in Dance's bibliography.

The historian's task is twofold: he has to establish facts and to assess their significance; the functions of collection and selection are inseparable. Ranke's ideal of writing history *wie es eigentlich gewesen*—as it actually happened—may appear to require the historian to act as a mirror of past events. In fact he has to be more of a prism, or a magnifying glass. Fundamentally, bias in history stems from the process of selection conditioned by the limitations of human existence and ability in relation to the vastness of the subject-matter. The research worker may at times be concerned less with interpretation than with the establishing of facts. On the other hand, "The textbook writer is a compiler rather than an original investigator, a distributor of knowledge not a primary producer" (Lauwers). It is not for him to discover new or dispute old facts, but because the scale and depth of his work are smaller, the problem of selection is all the greater. This applies not only to facts: on controversial topics it is unsurprisingly rare for textbook writers to disclose the clash of opinions. The pupil who has at his disposal several textbooks giving different points of view, or has a teacher critical of the interpretation exclusively favoured by the standard textbook, is fortunate in his temporary confusion. To a greater extent than the academic historian, the textbook writer is faced with what is perhaps the central dilemma of historical work: how to simplify without falsifying.

Dance makes clear at the outset that he appreciates the inevitability of bias in historical writing. He neatly demonstrates how even

dates can lie since they are subject to local calendar conventions, how parochial our traditional periodization of history really is, and how "objective" (2) lists of most important events, for all their likeness to scientific tabulations, differ from country to country. It must strike many as odd that of Creasy's eight "Decisive battles of the world" of the last thousand years six were fought by Englishmen; significantly, a more recent work on this subject by Maj. Gen. Fuller confines itself more modestly to the Western world, and the proportion is roughly half. Less unexpectedly, topics like the Great Armada, the Hundred Years' War, or the "shares" in the winning of the last World War receive very different treatment in textbooks of different countries. Yet in a remarkable recent B.B.C. programme, views elicited from a number of schoolchildren suggested that impartiality and breadth of view in history teaching are gaining ground, even if the sample was hardly representative and confined to western Europe.

Dance assumes that we all know what he means when he speaks of bias in history. But do we? There is no warning that his study is concerned almost exclusively with nationalist bias. This may be the most important and probably is the most blatant type of bias in historical writing but it is not the only one. What of, say, religious bias or class bias? These are more than marginal phenomena. And why is there no attempt—hopeless though it may be—to define bias even in the limited nationalist sense? One can only assume that Dance would agree, *mutatis mutandis*, with Dr Trevelyan's definition of it as: "any personal interpretation of historical events not acceptable to the whole human race." Nor does he examine the position of bias, somewhere between, on the one hand, deliberate propaganda, and, on the other, the sympathy of the writer for his villain-hero, or the 'interest' in his topic that drives him to investigate it. The name 'bias', as the author is no doubt aware, is frequently misapplied to this latter cast of mind which in fact is essential to historical work and controversy and need not affect the historian's judgment. Dance should not take the definition of his all-important term for granted. This omission obscures the implications of his argument that any ideological slant is equally permissible as long as the underlying belief is honestly held. It leads him also to point to Herodotus as the prototype of the biased historian. Herodotus, whose stock has been rising of recent years (3) as the Father of History, was inevitably a selective storyteller. Paradoxically, the more scientific. Thucydides was also the less impartial. It was he who invested western historio-

graphy with its traditional preoccupation with politics—elsewhere deplored by Dance—which always entails group partisanship.

Yet while political and military history is the most patently susceptible to group bias, Dance has also some illuminating things to say in Ch. 2 about the effect of national megalomania on the currently more fashionable cultural and economic history. It seems that great writers and priority of scientific invention are claimed and magnified by nations in history textbooks no less eagerly than victories on the battlefield. And the sad part of it is that magnifying the role one's own nation has played in the progress of mankind must mean minimising the part played by others. "School histories describing atomic research, if they are English, make Rutherford the big man; if . . . Scandinavian, Bohr; and at least one German book comes down with a single definite date—'1938: atom-splitting by Hahn'—mentioning no one else." Clio bemused indeed—but Dance oversimplifies the problem by blaming it all on to textbook writers' "ignorance in many countries of things that are commonplace in others"; some controversial claims have yet to be settled by specialist scholars.

There is an interesting but all too brief discussion of distorting history and inculcating nationalist bias through "verbal nuances which are barely noticeable". To use one set of words to describe a questionable action of a national hero and another set of words to describe a virtually identical course by a foreign leader—particularly if in direct conflict with our interests—is a practice all too common among textbook writers. Yet if interpretation of history cannot be wholly objective, the language in which it is couched, can. One would like Mr Dance to furnish more examples of the kind he found in a Russian textbook in a section discussing partitions of Poland: "Austria wished to *conquer*, Prussia to *annex* . . . Russia strove to *recover* Polish territories" (Dance's italics). One would also like him to give some specific examples of improvements in this sphere effected as a result of international co-operation.

The problem is a serious one for this subtle technique—and it is subtle when employed against children—postulates a false and dangerous dual standard of morality discriminating between the writer's own nation and others. If sometimes this is preferred to giving certain historical events an "X" certificate, which Dance advocates with regard to e.g. Walpole's political methods, so much the worse.

For a great many of us, who, Dance doubtless correctly surmises,

have never read a Nazi history textbook, he provides an excellent analysis of the standard one under the fitting heading of "Clio abused". This section, an incisive case study in subversion of history, should be compulsory reading for all history teachers—and many sixth formers. *Der Weg zum Reich* is as important an historical and historiographical document as it is poisonous. That *magistra vitae* should be capable of so complete a degradation, even though "of deliberate lies—statements contrary to the facts as known to competent historians, we shall find none whatever", is a grim comment on her pliability.

A dispassionate account of the Soviet approach to history reveals an intriguing dichotomy: somehow, apparently, it manages to press hard inflated claims of Russian cultural and military prowess, and at the same time to present "a view of world history far less narrow than that . . . found in the books of western Europe and America". That all history should be poured into the Marxist mould of class struggle, the Russians consider not only as intellectually correct but also as educationally desirable. For if in the West the inculcation of values and attitudes is seen as incidental to the teaching of history, the Communists see it as its supreme aim, and the word "indoctrination" has a positive flavour for them. The teacher of history is thus a conservative agent in their society, since history serves to glorify the existing system and is expounded in terms of official ideology. Dance's examples are drawn from the U.S.S.R. and her least troublesome satellites. It might have been of much interest to have considered also recent material from Poland, or from Yugoslavia which although Communist, is outside the Soviet sphere of influence.

Dance goes on to accuse the west of neglecting and denigrating Asia in its teaching of history. The root of this problem is, as has been perceptively said in another context, the "wrong and misleading [tendency] to explain world history as a function of national history". As long as it is generally held that history begins at home, the history of the homeland will take up much of the limited amount of time at the history teacher's disposal; and as long as it does, it will be an uphill task to try to leave the pupils with the impression that certain nations with whom we have had very scanty dealings, may have made great contributions to the development of mankind.

Dance's analysis and argument, presented in the first five chapters of his timely inquiry, close with a discussion of the difficulties of teaching the history of Europe as a whole rather than as a story of so many warring and divided nations. In the last chapter he

describes efforts made since the "Peace Congress" of 1849, and particularly in the last forty years, to combat nationalist bias in the teaching of history and thereby to promote better international relations. Occasional lapses into florid and bombastic style may be excused an enthusiast who must be delighted to find more and more official support for the "movement" into which he has put a great deal of work over many years. But he admits that his zeal is not very widely shared in this country, since: "British teachers are all too ready to believe that because our textbook writers are the freest of all from official interference, our textbooks are therefore freest of all from national bias." The point is well taken. Consider for example the opening remarks of a little textbook on "Citizenship" by Dr S. Johnson: "To be a British subject is a matter for pride, since those who can claim this privilege are members of the largest and freest Empire that has ever been. Naturally, the praises of the Empire and the Motherland have been often sung, and when you begin to think about things for yourself, the question may occur to you: 'Why is our country as great and as good as people say?'"

But is complacency alone responsible? Among the opponents of his cause, Dance avers, "the notion of school teachers tinkering with school history seemed abhorrent". The question turns, perhaps, largely upon whether the tinkering is individual and spontaneous or prearranged. The distrust of the rewriting of history on directives from above, even for the best of motives, is not an entirely unhealthy attitude. We may well fear the kind of "rectification" of history that Orwell envisaged in his *1984*. Do we really want one type of bias merely to yield to another, chauvinism to be replaced by deliberate internationalism or pacifism that will simply play down past conflicts if no longer run down past enemies? The historian who, in order to help us forgive, seeks that we should forget, is false to his discipline. These are delicate and difficult matters where *festina lente* may be the best policy, and Dance puts his finger on the heart of the problem in conceding that: "attempts to be fair to foreigners can involve a tendency to be unfair to one's own country". What is wanted, however, is not a condemnation of "nationalists believing . . . in 'my country right or wrong'", for this is an attitude expressive of patriotic loyalty open to reason. The pernicious cry of those whose moral and critical faculties are dimmed by aggressive, xenophobic chauvinism, is "my country's always right". There is still to-day much to be said for a history that fosters the feeling of community through emphasising the common heritage of any given nation, but

if it promotes attitudes of this type, then indeed it becomes indefensible.

In brief, Mr Dance's thesis is that history teaching, because of its nationalist bias, is a dividing, though it might and ought to be an integrating, force in the world. It is difficult not to agree that nationalist bias in the teaching of history is undesirable and that much can be done to reduce it—though the author tends to make light of the difficulties. But the validity of his argument and the usefulness of the work of the "movement" depend partly on a chain of debatable assumptions: that textbooks are the most important factor in the teaching of history at school; that what we learn at school conditions our appreciation of history more than any other influences; and that his historical education is the decisive element in determining John Citizen's attitudes towards other nations. These presuppositions need to be carefully investigated to guide and supplement the efforts described in the last chapter. Meanwhile, if Mr Dance's treatment of the subject is not as deep or comprehensive as the reader might wish, he has nevertheless performed a signal service to history by focussing our attention upon the problem of bias and by providing much thought-provoking and not readily accessible information.

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BOOK NOTICES

LOUIS ARNAUD REID, *Ways of Knowledge and Experience* (George Allen and Unwin, 1961, 40s.).

E. B. CASTLE, *Ancient Education and Today* (Penguin Books Ltd. (Pelican), 1961, 3s. 6d.).

BASIL FLETCHER, *A Philosophy for the Teacher* (O.U.P., 1961, 148 pp., 10s. 6d.).

LORD JAMES OF RUSHOLME, *Education and Democratic Leadership* (O.U.P. (Walker Trust Lectures on Leadership, No. XII), 1961, 3s. 6d.).

THESE very different books, have, though not equally explicitly, a common underlying idea—namely that truth and goodness in the last resort are embodied and expressed in persons. There is of course a sense in which we can properly speak of a true proposition or a good action. But there is a deeper sense in which it is people who are good and true. This idea has obvious and timely implications for education; for it means that the quality of civilisation depends on the quality of people rather than upon the organisation of knowledge or the elaboration of techniques: or, rather, that the development of knowledge and techniques is essentially a personal activity. We are well aware of the danger lest, under pressure to push children through the eleven-plus, sixth-formers through their 'A' levels, and undergraduates through their B.Sc's, we produce performances rather than persons.

Professor Reid's long-awaited and much needed book on *Ways of Knowledge* is a delight. By a professional philosopher who really knows what he is talking about and in whose bonnet there are no bees, written in sensitive, civilised English, entirely free from jargon, it can be read with profit equally by the student of philosophy and by the intelligent general reader with no special philosophical training.

The author uses "knowledge" in a wider sense than is common among philosophers and scientists, to include sense-perception, artistic experience, science, history, myth, religion, and personal encounter. Each kind of knowledge needs its distinctive and appropriate symbols and signs—its own kind of "logos". Yet all ways of knowing have certain features in common. All start from some kind of encounter with, or involvement in, some object of experience; all seek insight; all articulate themselves in symbols (though knowledge is never identical with its symbolic expression) all have some practical aspect—i.e. make for better adjustments in the world (this is true even of art, since artistic experience is in fact a form of living and requires activity); and all are partial.

In the fourth main section of the book, Professor Reid develops the thesis that knowledge is essentially personal. No summation of statements can add up to knowledge. In this argument he recalls the recent writings of Dr Michael Polanyi. Knowledge is personal in two important senses. First, knowledge is possessed only by the living mind. For that reason knowledge is dynamic, not static—activity, not structure. Knowledge is not a constructed intellectual scheme, but a personal acquisition—the ever-growing wisdom of a person. The unity of knowledge is a “living dialectic”. There is a memorable passage on p. 283 (too long to quote) which illustrates the part played by the different kinds of knowledge in making a coherent and balanced person.

Secondly, knowledge is personal because it requires personal relations. “It is indeed through the understanding of others that our own experience and personality grow.” In this connexion Professor Reid stresses the importance of personal intercourse as growing together, not merely increased knowledge about the other person. “The I and Thou grow because of We, and this attainment of growth is a great deal more than increased knowledge.” He quotes Jaspers: “I am through communion with the other”.

In the best human relations there is an inescapable tension or frustration arising from the fact that friends or lovers long to break down the separateness between them which, in the nature of the case, cannot be broken down, and breaking-down of which (if it were possible) would destroy the relationship, since the maintenance of individual identity is part of the meaning of love. In a chapter on the Christian religion, Professor Reid suggests that the frustrating “externality” of each to the other may be transcended by the realization that both are one in God. In this setting the externality of I and Thou is transformed. But this recognition of the transcendence of separateness in God also lays an authority upon the human persons; their friendship or love must be consecrated to what is of God.

Professor Reid throws another light on the essentially personal character of knowledge in a chapter on Christianity and History. Here (p. 159) he reminds us of one of the profoundest articles of Christian theology—that the “language” of God was a Person—the incarnate Logos.

Notwithstanding the contrast between the anthropocentricity of Greek thought and Hebrew theocentricity, the Hebrews, Greeks and (to a less extent) the Romans affirmed the truth that the ultimate test of education is the quality of personal life and its ultimate aim the nurture of good men. Professor Castle, in one of the best 3/6-worths that we have seen for some time, discusses the question: What relevance have the ideas of Greece, Rome and Palestine to the education of children in our own day? He writes with ease, vigour and lucidity, and to his task he brings sound scholarship informed by a gracious spirit. The book holds one's interest from the first page to the last. A useful bibliography is appended.

Considering how much has already been published on the educational

thought and practice of Greece and Rome, it is the more to Professor Castle's credit that he has made this part of his book so lively and fresh. His knowledge is up to date (witness his observations on the position of women in Athens), and there is a new emphasis here and there (e.g. on the importance of Isocrates, whose pan-Hellenic vision came true not very long after his death). Professor Castle has helped at least one reader to understand the Spartans as never before. In his discussion of Athens he makes it clear that the essential problem was how to make democracy work (equally a problem for us), and that the solution was to be found not in terms of curriculum but in terms of the ideal of social and individual living which the state existed to foster. "Briefly, the Greeks believed that the greatest work of art they had to create was a Man".

Most general histories of education pay scant attention to the Hebrew contribution. The part of Professor Castle's book which has most novelty is the section on educational thought and practice in Judea. Not only were the Hebrews, in their thinking, the most steadfastly theocentric of ancient peoples but they were among the first to identify religion with morality—an identification which is by no means self-evident. And, because God had a purpose for which Israel was His chosen instrument, the Hebrews were the first among ancient peoples to have a dynamic and dialectic sense of history, which gave all their thinking a quality of urgency.

Jewish education began in the synagogues; and it is interesting to observe that it was at first *adult* education only (it was the business of parents to pass on what they had learnt to their children). Schools for boys of 16 or 17 were organised after the Maccabean Revolt of 168 B.C., and later for children from the age of six. It took nearly seven centuries for Jewish education to extend downwards to reach small children; and by then the Jews were a stateless and scattered people. It is notable, however, that the Jews had a more liberal attitude towards children than ever developed in Greece or Rome. In the Talmud can be seen the beginnings of the tender attitude to children which reaches its highest point in Jesus' teaching that children are the first citizens of the Kingdom of Heaven.

Professor Castle goes on to a brief discussion of the Renaissance as an attempt to harmonise the Greek conception of the wholeness of man with the Hebrew-Christian sense of man's dependence on God. He ends with a concise and illuminating analysis of the contributions that Greek, Roman and Jewish education have to offer to our own times. It is no more the reviewer's business to summarise this part of the book than to disclose the solution of a Whodunnit.

Professor Fletcher has not long returned from Africa where for some years he was Vice-Principal of the University College of Rhodesia and Nyasaland. He has taught in schools in Uganda, China (since the Communists took control), and Canada, as well as in this country, and in English universities. By reason of his wide practical experience, and his personal liking for people (children not least), he is no armchair philosopher,

His book contains much shrewd common sense. He is not concerned with philosophy as an academic exercise, but uses the word in its widest and original sense, to mean love of wisdom. He believes that the philosopher has not done his job unless he has made some practical contribution to the world in which he lives. "Almost every philosopher, like Plato, is a reformer of society." What Professor Fletcher means, in terms of education, is that the teacher will do his job better if he has thought-out, coherent reasons for what he does.

It is not entirely clear for what readers the book is intended; presumably Professor Fletcher is writing for students who are training to be teachers. The book should be a helpful introduction to the often difficult and unaccustomed business of learning to think about the nature and purpose of education.

Perhaps Professor Fletcher tries to discuss too many things in 150 pages; the exposition is at times rather bitty. He does not frame a total philosophy of education. But it is clear that his own educational faith is a Christian one, and that, in his view, any purely secular interpretation of education is bound to be out of balance. He says some good things in a brief section on Christian education and the Christian school. There is also an interesting discussion of the secondary school curriculum.

Lord James, in his Walker Trust Lecture, also has something to say about curriculum at the secondary level. He believes strongly in selective schools, as the best means of giving full educational opportunity to the ablest children; and he insists on the need for enough "general" studies in the higher reaches of the curriculum as well as specialised studies. He starts with the proposition (which Professor Castle also states) that democracy needs leadership, and that, as democracy becomes more complex, a more complex conception of leadership is needed. To the question: What are the qualities of democratic leadership? Lord James answers: first, high intelligence (with the corollary that we must acknowledge the natural inequality of people and the need for full educational opportunity for the ablest); secondly, a group of moral qualities including integrity, courage, temperance, tact, flexibility and, not least, humility of spirit. For anyone who has just read Professor Castle's book, Lord James's list of qualities evokes two-and-a-half millennia of confluent tradition. Lord James recognises that democracy means different things to different people. It is some indication of his own view that, while he does not accept T. S. Eliot's aristocratic idea, he nevertheless values highly the best traditional standards and attitudes which are transmitted through family and class, and is alive to the dangers of a meritocracy which has no roots but what Sir Wilfrid Martineau recently called "the false doctrine that, if (a boy) can but pass examinations, the world is at his feet".

M. V. C. JEFFREYS

MARGARET GRANT, *School Methods With Younger Children: A Handbook for teachers in Africa* (Evans, 1961, 12s. 6d.).

THIS book is intended as a reference book for primary school teachers in Africa. The author is clearly a teacher and teacher-trainer of considerable experience who is not only familiar with the primary classroom but also with the mentality and interests of the African teacher. There is no doubt that her book will be of particular value to the untrained and partially trained teacher, on whom so much of the primary education depends in territories whose systems are expanding rapidly to keep step with political advance.

The book falls into two main sections, the first dealing with "education" that is the child, the teacher and the classroom in general, and the second with the method of teaching the main and some subsidiary subjects on the time-table. In the first Miss Grant, who has turned to good advantage her advanced training in psychology, tells the teacher that the child is not just a name on a crowded register, but an individual with his own needs, interests and capabilities, all of which are relevant to learning. This section also contains a great deal of practical information on the planning and setting-up of a new school and the basic equipment needed, and lists the headmaster's duties towards the children, his staff and the community in which he serves. If there is one criticism on this very useful and practicable section, it is that the author introduces here (and explains) a division into the Infant and Junior Primary school, which is applicable to Nigeria, but not to many other territories for which this book is obviously intended.

The second main section of the book is devoted to the method of teaching the three main primary subjects, Arithmetic, Vernacular and English, and three "more" subjects, Art and Craft, Hygiene and Nature Study. The part dealing with Arithmetic gives in some 50 pages an excellent resumé of the main processes with which the primary pupil will have to cope. These are discussed with examples and diagrams (the latter are of a high standard throughout the book) and are intended to support the (prescribed) text-book. A teacher who has read this section will have a very good idea of the problems involved in teaching arithmetic at the primary level.

It is in the next two parts, dealing with Vernacular and English methods that some doubts come to mind. First of all, a case is made out for the teaching of reading and writing in the vernacular; the teacher will only introduce English reading when he is satisfied with a child's progress in vernacular. In view of the individual differences of each child which the author stresses in the first section, is this really practicable? In the same paragraph we have already been told that no English word should be seen by an African child, either in print or on the blackboard, until the teacher has taught it orally. Surely, this is hardly realistic in territories where English is the *lingua franca* and the English word appears on public notices, road signs, lorries, tins and other household goods? The case for the

vernacular had already been weakened on the very first page dealing with that subject by the author's own admission that "unfortunately there is little for the child to read in his own language once he has left school, except vernacular letters and newspapers".

The very part on vernacular method illustrates these difficulties, as all examples and diagrams have necessarily to be in English, and are then omitted in the English method chapters to avoid duplication. Even if the claims of vernacular are admitted, I feel it might have been preferable to have a single section on Language, and to show the essential differences in teaching vernacular and English where applicable. Principles apart, the teaching method contained in these two chapters is again impeccable and there are very useful paragraphs on common mistakes, and the teaching of poetry.

Lastly, in the methods section, we get sound and practical surveys on the teaching of three other subjects on the primary time-table, Art and Craft, Hygiene and Nature Study. As the author had limited herself to the type of work which might be included in a teachers' certificate examination, the omission of physical education and some form of what is generally termed "social studies" can probably be explained. It is perhaps noteworthy that the latter subject has received some considerable attention by the Ministry of Education in Ghana, which has compiled a syllabus based on the centres-of-interest method, and which might well have application elsewhere.

The book ends with a brief, but comprehensive (and inexpensive) reading list. A book which might perhaps have been included is *Equipping the Classroom* by A. Taylor (Nelson), and a possible alternative in English is Elliot and Gurrey, *Language Teaching in African Schools* (Longmans), and in science, E. D. Joseph, *The Teaching of Science in Tropical Primary Schools* (O.U.P.)

There is no doubt that this is a very valuable book which helps to fill the great gap in books which have practical application for the primary (and secondary modern) teacher in Africa. The author has passed on her own considerable experience in the classroom to excellent advantage, and the book can be strongly recommended to young teachers as a guide, and to those with more experience as a reference book of practical value.

R. H. F. DALTON.

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'A thoroughly practical manual' M. C. V. JEFFREYS in
the BIRMINGHAM POST. 21s. net; paperback 11s. 6d. net

CAMBRIDGE UNIVERSITY PRESS

10 AUG 1961

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EDUCATIONAL REVIEW

Vol. 13, No. 3

June 1961

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